

# **Emergency Medical Services Medical Practice Protocols**



**Orange County NC  
Emergency Medical Services  
University of North Carolina  
Hospitals**

Orange County Emergency Medical Services  
And  
University of North Carolina Hospitals

**Prehospital  
Advanced Life Support  
Protocols, Policies, and Procedures**

**2020 Version**

Updated Aug 2020

The pages that follow represent the hard work and dedication of the frontline emergency medical caregivers within Orange County Emergency Medical Services and UNC-Hospitals Emergency Department. It is impossible to give individual credit to all that have been involved in the shaping of this manual, but their work and efforts are much appreciated.

These protocols are a direct reflection of many hours of hard work by, Kyle Ronn, Quality Assurance Coordinator, The OCES Protocol Committee, Dr. Joseph Grover, OCES Medical Director, Kim Woodward, OCES Operations Manager and Jim Gusler, OCES Training Coordinator. Without their dedication and perseverance, there would be no manual.

The North Carolina Office of Emergency Medical Services has approved all advanced life support protocols contained in this manual.

**The version of this manual reflects an ongoing effort to provide the best, appropriate EMS care based on each patient's needs and outcomes. The advanced differential and disposition components of each protocol are based on a defined program of initial training, continuing education, and ongoing quality management. Use of these protocols in any system outside of Orange County Emergency Medical Services is unproven and may result in an undue risk to the patient and to the EMS system and personnel involved.**

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## EMS Protocols - Formatting Conventions

For ease of learning and as an educational tool, the following graphical formatting conventions have been incorporated in this edition of the Orange County EMS Advanced Life Support protocols.

Protocols, Procedures, Policies, and Appendices are denoted by each individual number and divided into appropriate sections. Page numbers are not used to keep a fluid document in the event of necessary changes.

Protocols Referenced protocols are designated by this symbol



Medical Control Medical Control is designated by this symbol



When a protocol step FOLLOWS a specific "Contact Medical Control" box in the chosen branch, direct Medical Control orders are required to continue with further treatment.

Most of the Protocols are now two pages and there are now "notes" section for your utilization.

Several alternative medications have been placed in this manual in case of drug shortage. In the event of drug shortage, in service education will occur before placing the alternative medication in service.

# Introduction

The following medical treatment protocols are developed for North Carolina EMS agencies. The process has evolved since 2007 and continues with input from Medical Directors, EMS Administration, North Carolina Chapter of Emergency Physicians Protocol Committee, North Carolina Office of EMS, EMS field personnel and the public at large through on-line surveys, public meetings across North Carolina and direct communication with stakeholders. The 2017 update expands on the 2012 and 2009 version and continues to incorporate evidence-based guidelines, expert opinion and historically proven practices meant to ensure that citizens and visitors of North Carolina will continue to be provided the highest quality pre-hospital patient care available. The North Carolina Chapter of Emergency Physicians develops and provides final approval.

The purpose of the protocol section is to provide treatment protocols outlining permissible and appropriate assessment, delivery of care, reassessment and procedures which may be rendered by pre-hospital providers. The protocols also outline which medical situations require direct voice communication with medical control. In general treatment protocols are specific orders which may and should be initiated prior to contact with Medical Control.

**Please note the medical protocols are divided into three (3) to four (4) sections.** The upper section includes three (3) boxes (History, Signs and Symptoms and Differential) which serves as a guide to assist in obtaining pertinent patient information and exam findings as well as considering multiple potential causes of the patients complaint. It is not expected that every historical element or sign / symptom be recorded for every patient. It is expected that those elements pertinent to your patient encounter will be included in the patient evaluation.

**The algorithm section describes the essentials of patient care. Virtually every patient should receive the care outlined in this section, usually in the order described. However each medical emergency must be dealt with individually and appropriate care determined accordingly. Professional judgment is mandatory in determining treatment modalities within the parameters of these protocols. Circumstances will arise where treatment may move ahead in the algorithm, move outside to another protocol and then re-enter later. While protocols are written based on body systems and primary complaints the patient should be treated as a whole and therefore the protocols should be considered as a whole in providing care.**

## Professional judgment hierarchy:

The pre-hospital provider may determine that no specific treatment is needed;

Or

The pre-hospital provider may follow the appropriate treatment protocols and then consult Medical Control;

Or

The pre-hospital provider may consult Medical Control before initiating any specific treatment.

**Some protocols will encompass two (2) pages.** Protocols which exist in a single page format may have page 2 added by the local medical director. The PEARLS section will either be located at the bottom of page 1 (single page protocol) or page 2 (double page protocol). The PEARLS section provides points regarding the main protocol based on evidence to date, common medical knowledge and expert medical opinion.

**Information boxes highlighted in purple.** These areas are editable at the local level. They will mainly involve specific medications and dosages utilized by the local EMS agency. Page 2 will have a large section highlighted in purple where the local Medical Director may edit as they see fit to provide expanded points and treatment not otherwise specified in the algorithm. If the box is not to be utilized – add ***“This Space Left Blank Intentionally.”***

Finally these medical treatment protocols are established to ensure safe, efficient and effective interventions to relieve pain and suffering and improve patient outcomes without inflicting harm. They also serve to ensure a structure of accountability for Medical Directors, EMS agencies, pre-hospital providers and facilities to provide continual performance improvement. A recent report of the Institute of Medicine calls for the development of standardized, evidence-based pre-hospital care protocols for the triage, treatment and transport of patients. These protocols establish expectations of pre-hospital care in North Carolina.



# Introduction

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(2020 Version 6.5)



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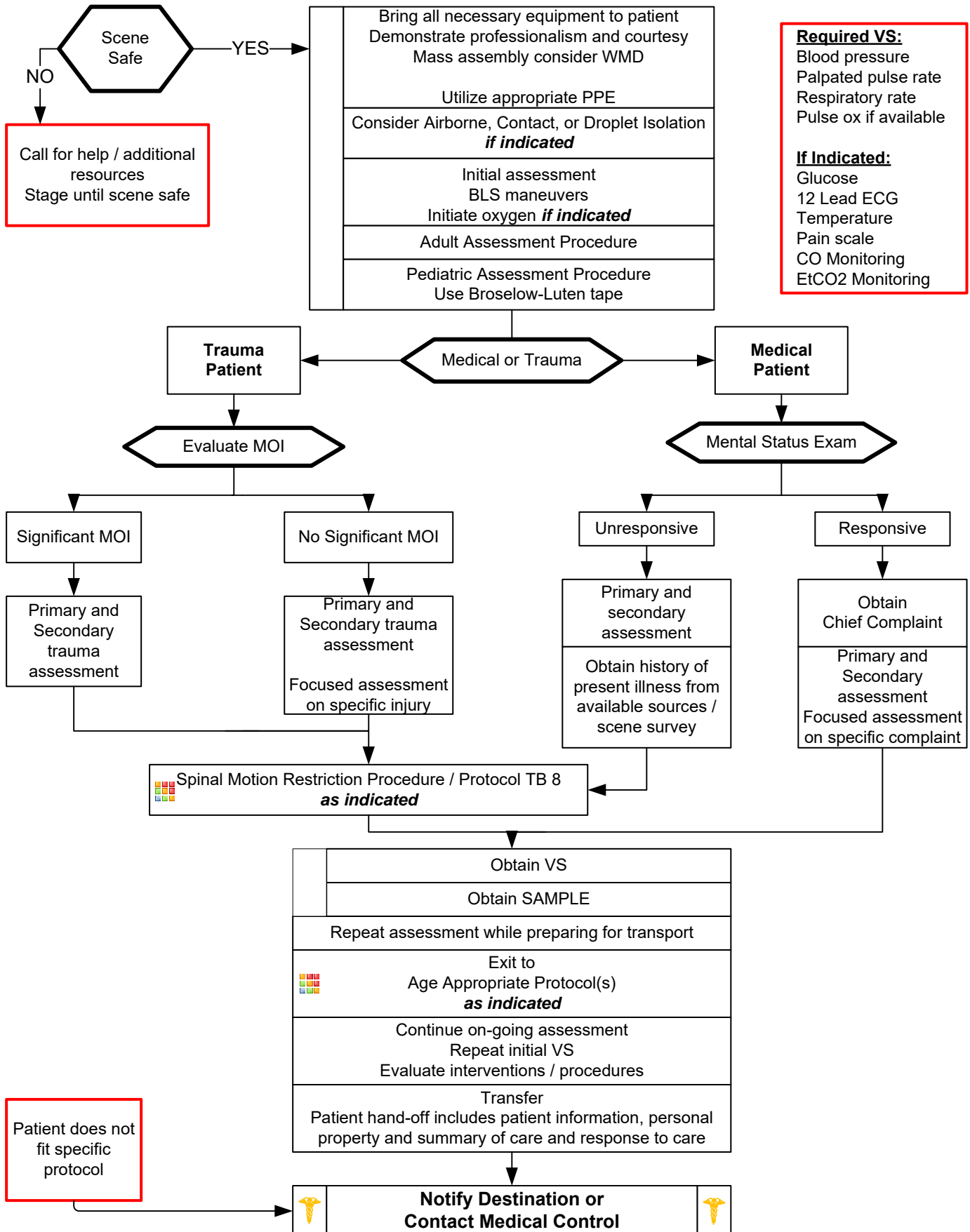
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# Universal Patient





# Universal Patient Care



Universal Protocol Section



# Universal Patient Care



## Pearls

- **Recommended Exam: Minimal exam if not noted on the specific protocol is vital signs, mental status with GCS, and location of injury or complaint.**
- **Any patient contact which does not result in an EMS transport must have a completed disposition form.**
- **Vital signs should be obtained before, 10 minutes after, and at patient hand off with all pain medications.**
- **2 complete vital sign acquisitions should occur at a minimum with a patient encounter.**
- **Patient Refusal**

Patient refusal is a high risk situation. Encourage patient to accept transport to medical facility. Encourage patient to allow an assessment, including vital signs. Documentation of the event is very important including a mental status assessment describing the patient's capacity to refuse care.

Guide to Assessing capacity:

**C: Patient should be able to communicate a clear choice:** This should remain stable over time. Inability to communicate a choice or an inability to express the choice consistently demonstrates incapacity.

**R: Relevant information is understood:** Patient should be able to display a factual understanding of the illness, the options and risks and benefits.

**A: Appreciation of the situation:** Ability to communicate an understanding of the facts of the situation. They should be able to recognize the significance of the outcome potentially from their decision.

**M: Manipulation of information in a rational manner:** Demonstrate a rational process to come to a decision. Should be able to describe the logic they are using to come to the decision, though you may not agree with decision.

- **Pediatric Patient General Considerations:**

**A pediatric patient is defined by fitting a Length-based Resuscitation Tape, Age  $\leq 15$ , weight  $\leq 49$  kg.**

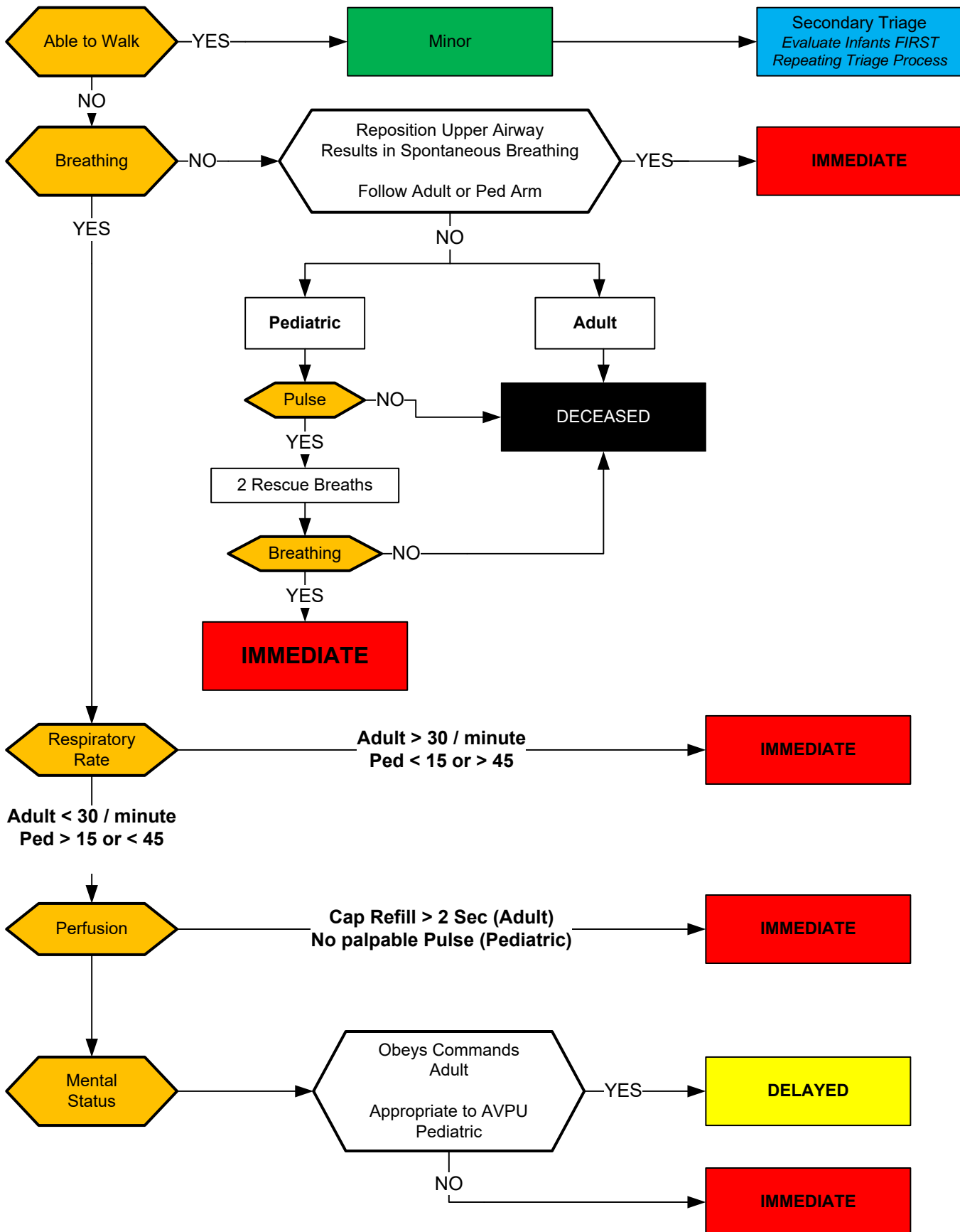
Patients off the Broselow-Luten tape should have weight based medications until age  $\geq 16$  or weight  $\geq 50$  kg. Special needs children may require continued use of Pediatric based protocols regardless of age and weight. Initial assessment should utilize the Pediatric Assessment Triangle which encompasses Appearance, Work of Breathing and Circulation to skin.

The order of assessment may require alteration dependent on the developmental state of the pediatric patient. Generally the child or infant should not be separated from the caregiver unless absolutely necessary during assessment and treatment.

- Timing of transport should be based on patient's clinical condition and the transport policy.
- Never hesitate to contact medical control for patient who refuses transport.
- Blood Pressure is defined as a Systolic / Diastolic reading. A palpated Systolic reading may be necessary at times.
- SAMPLE: Signs / Symptoms; Allergies; Medications; PMH; Last oral intake; Events leading to illness / injury



# Triage







# Triage



## Pearls

- **When approaching a multiple casualty incident where resources are limited:**  
Triage decisions must be made rapidly with less time to gather information  
Emphasis shifts from ensuring the best possible outcome for an individual patient to ensuring the best possible outcome for the greatest number of patients.
- **Scene Size Up:**
  1. **Conduct a scene size up. Assure well being of responders. Determine or ensure scene safety before entering. If there are several patients with the same complaints consider HazMat, WMC or CO poisoning.**
  2. **Take Triage system kit.**
  3. **Determine number of patients. Communicate the number of patients and nature of the incident, establish command and establish a medical officer and triage officer if personnel available**
- **Triage is a continual process and should recur in each section as resources allow.**
- **Step 1: Global sorting:**  
Call out to those involved in the incident to walk to a designated area and assess third.  
For those who cannot walk, have them wave / indicate a purposeful movement and assess them second.  
Those involved who are not moving or have an obvious life threat, assess first.
- **Step 2: Individual assessments:**  
Control major hemorrhage  
Open airway and if child, give 2 rescue breaths  
Perform Needle Chest Decompression Procedure if indicated.  
Administer injector antidotes if indicated
- **Assess the first patient you encounter using the three objective criteria which can be remembered by RPM.**  
**R: Respiratory**  
**P: Perfusion**  
**M: Mental Status**  
If your patient falls into the RED TAG category, stop, place RED TAG and move on to next patient. Attempt only to correct airway problems, treat uncontrolled bleeding, or administer an antidote before moving to next patient.
- **Treatment:**
  - Once casualties are triaged focus on treatment can begin. You may need to move patients to treatment areas. RED TAGs are moved / treated first followed by YELLOW TAGs. BLACK TAGs should remain in place.
  - You may also indicate deceased patients by pulling their shirt / clothing over their head.
  - As more help arrives then the triage / treatment process may proceed simultaneously.
  - Capillary refill can be altered by many factors including skin temperature. Age-appropriate heart rate may also be used in triage decisions.



# Abdominal Pain Vomiting and Diarrhea



## History

- Age
- Time of last meal
- Last bowel movement/emesis
- Improvement or worsening with food or activity
- Duration of problem
- Other sick contacts
- Past medical history
- Past surgical history
- Medications
- Menstrual history (pregnancy)
- Travel history
- Bloody emesis / diarrhea

## Signs and Symptoms

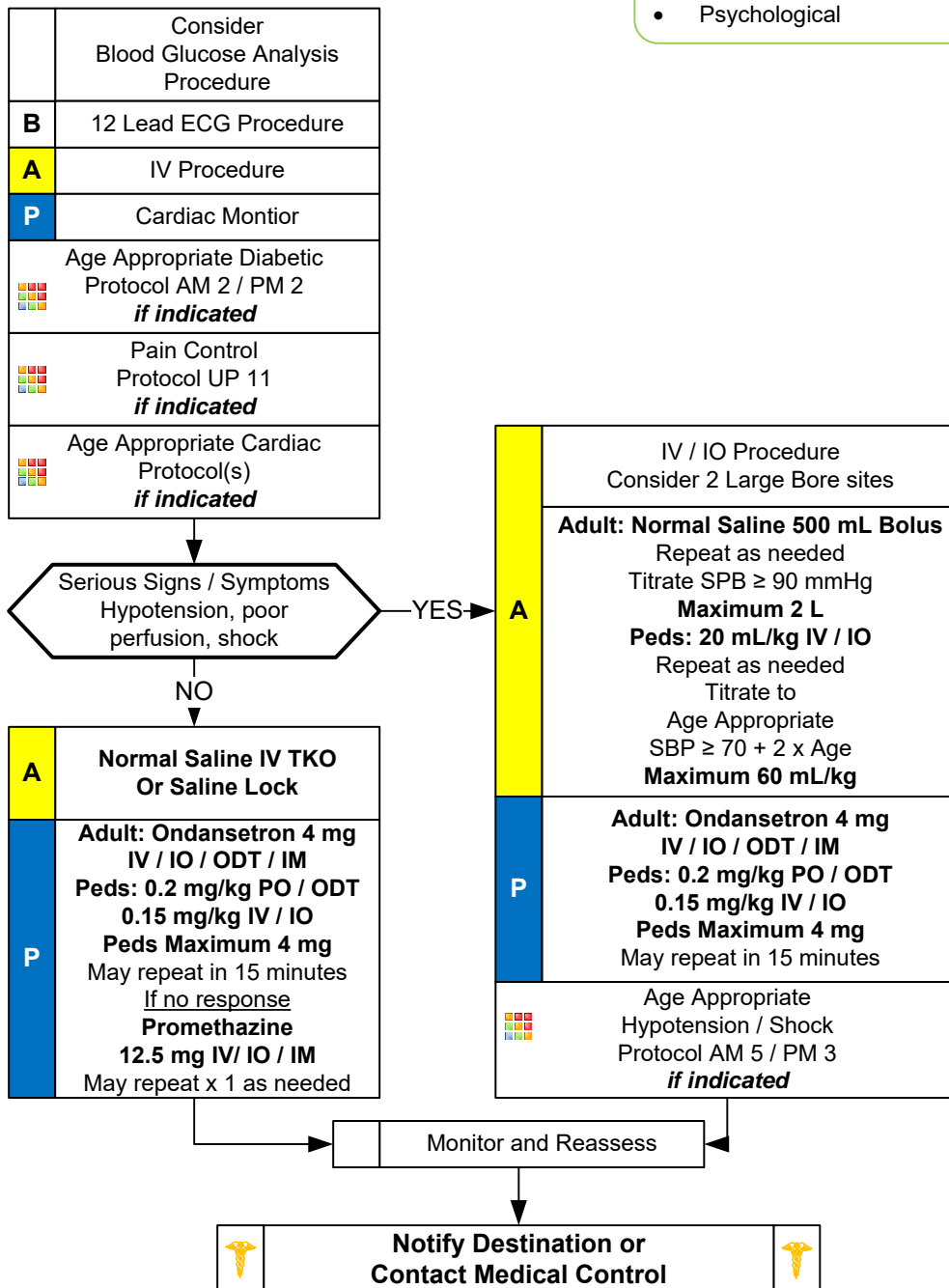
- Pain
- Character of pain (constant, intermittent, sharp, dull, etc.)
- Distention
- Constipation
- Diarrhea
- Anorexia
- Radiation

### Associated symptoms:

Fever, headache, blurred vision, weakness, malaise, myalgias, cough, headache, dysuria, mental status changes, rash

## Differential

- CNS (increased pressure, headache, stroke, CNS lesions, trauma or hemorrhage, vestibular)
- Myocardial infarction
- Drugs (NSAID's, antibiotics, narcotics, chemotherapy)
- GI or Renal disorders
- Diabetic ketoacidosis
- OB-Gyn disease (ovarian cyst, PID, Pregnancy)
- Infections (pneumonia, influenza)
- Electrolyte abnormalities
- Food or toxin induced
- Medication or Substance abuse
- Psychological





# Abdominal Pain Vomiting and Diarrhea



## Pearls

- **Recommended Exam:** Mental Status, Skin, HEENT, Neck, Heart, Lungs, Abdomen, Back, Extremities, Neuro
- **Age specific blood pressure** 0 – 28 days > 60 mmHg, 1 month - 1 year > 70 mmHg, 1 - 10 years > 70 + (2 x age) mmHg and 11 years and older > 90 mmHg.
- **Abdominal / back pain** in women of childbearing age should be treated as pregnancy related until proven otherwise.
- **The diagnosis of abdominal aneurysm should be considered with abdominal pain, with or without back and / or lower extremity pain or diminished pulses, especially in patients over 50 and / or patients with shock/ poor perfusion. Notify receiving facility early with suspected abdominal aneurysm.**
- **Consider cardiac etiology in patients > 50, diabetics and / or women especially with upper abdominal complaints.**
- **Repeat vital signs after each fluid bolus.**
- **Heart Rate:** One of the first clinical signs of dehydration, almost always increased heart rate, tachycardia increases as dehydration becomes more severe, very unlikely to be significantly dehydrated if heart rate is close to normal.
- **Promethazine (Phenergan) may cause sedative effects in pediatric patients and ages  $\geq 60$  and the debilitated, etc.) When giving promethazine IV dilute with 10 mL of normal saline and administer slowly as it can also harm the veins.**
- Beware of vomiting only in children. Pyloric stenosis, bowel obstruction, and CNS processes (bleeding, tumors, or increased CSF pressures) all often present with vomiting.
- Document the mental status and vital signs prior to administration of Promethazine (Phenergan).
- Isolated vomiting may be caused by pyloric stenosis, bowel obstruction, and CNS processes (bleeding, tumors, or increased CSF pressures).
- Vomiting and diarrhea are common symptoms, but can be the symptoms of uncommon and serious pathology such as stroke, carbon monoxide poisoning, acute MI, new onset diabetes, diabetic ketoacidosis (DKA), and organophosphate poisoning. Maintain a high index of suspicion.

## Disposition:

### EMS Transport:

- ALS:** All patients with potential for cardiac, CNS, renal, traumatic, or diabetic ketoacidosis etiologies. All patients who receive Morphine or Fentanyl and/or anti-emetic.
- BLS:** No abnormal vital signs and does not fit criteria above.

### MD Within 4 Hours:

Age >5 or <50, resolved abdominal pain with no associated symptoms, no known kidney disease, and normal vital signs unless otherwise directed by paramedic-MD consultation.



# Altered Mental Status



## History

- Known diabetic, medic alert tag
- Drugs, drug paraphernalia
- Report of illicit drug use or toxic ingestion
- Past medical history
- Medications
- History of trauma
- Change in condition
- Changes in feeding or sleep habits

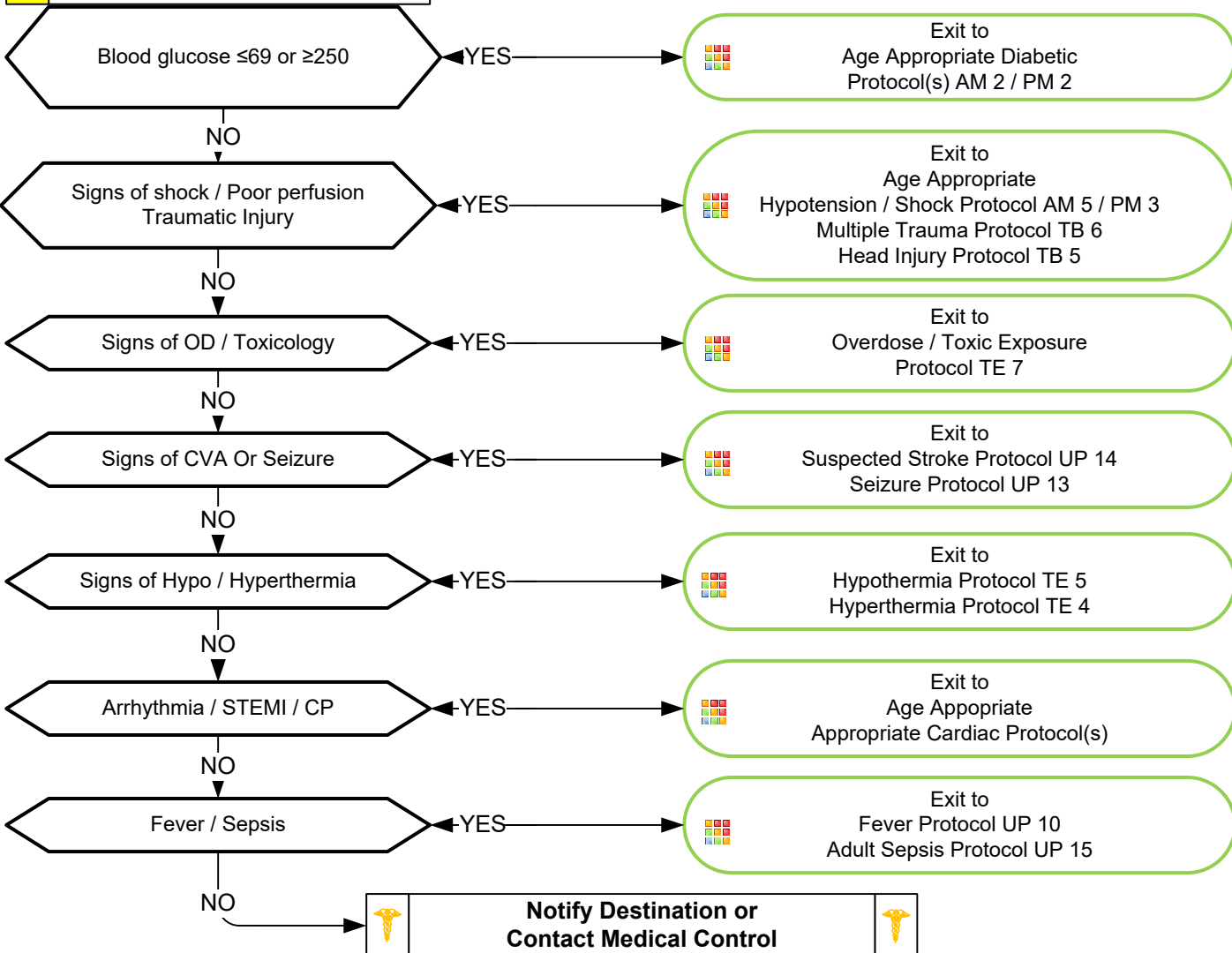
## Signs and Symptoms

- Decreased mental status or lethargy
- Change in baseline mental status
- Bizarre behavior
- Hypoglycemia (cool, diaphoretic skin)
- Hyperglycemia (warm, dry skin; fruity breath; Kussmaul respirations; signs of dehydration)
- Irritability

## Differential

- Head trauma
- CNS (stroke, tumor, seizure, infection)
- Cardiac (MI, CHF)
- Hypothermia
- Infection (CNS and other)
- Thyroid (hyper / hypo)
- Shock (septic, metabolic, traumatic)
- Diabetes (hyper / hypoglycemia)
- Toxicological or Ingestion
- Acidosis / Alkalosis
- Environmental exposure
- Pulmonary (Hypoxia)
- Electrolyte abnormality
- Psychiatric disorder

Age Appropriate Airway Protocol(s) AR 1, 2, 3, 5, 6 <i>if indicated</i>	
	Blood Glucose Analysis Procedure
<b>B</b>	12 Lead ECG Procedure
<b>A</b>	IV / IO Procedure



Universal Protocol Section



# Altered Mental Status



## Pearls

- **Recommended Exam: Mental Status, HEENT, Skin, Heart, Lungs, Abdomen, Back, Extremities, Neuro.**
- **AMS may present as a sign of an environmental toxin or Haz-Mat exposure - protect personal safety.**
- **General:**
  - The patient with AMS poses one of the most significant challenges.**
  - A careful assessment of the patient, the scene and the circumstances should be undertaken.**
  - Assume the patient has a life threatening cause of their AMS until proven otherwise.**
  - Pay careful attention to the head exam for signs of bruising or other injury.**
  - Information found at the scene must be communicated to the receiving facility.**
- **Substance misuse:**
  - Patients ingesting substances can pose a great challenge.
  - DO NOT assume recreational drug use and / or alcohol are the sole reasons for AMS.
  - Misuse of alcohol may lead to hypoglycemia.
  - More serious underlying medical and trauma conditions may be the cause.
- **Behavioral health:**
  - The behavioral health patient may present a great challenge in forming a differential.
  - DO NOT assume AMS is the result solely of an underlying psychiatric etiology.
  - Often an underlying medical or trauma condition precipitates a deterioration of a patients underlying disease.
- **Spinal Motion Restriction / Trauma:**
  - Only utilize spinal immobilization if the situation warrants.
  - The patient with AMS may worsen with increased agitation when immobilized.
- **It is safer to assume hypoglycemia than hyperglycemia if doubt exists. Recheck blood glucose after Dextrose or Glucagon**
- Do not let alcohol confuse the clinical picture. Alcoholics frequently develop hypoglycemia and may have unrecognized injuries.
- Consider Restraints if necessary for patient's and/or personnel's protection per the restraint procedure.



# Back Pain



## History

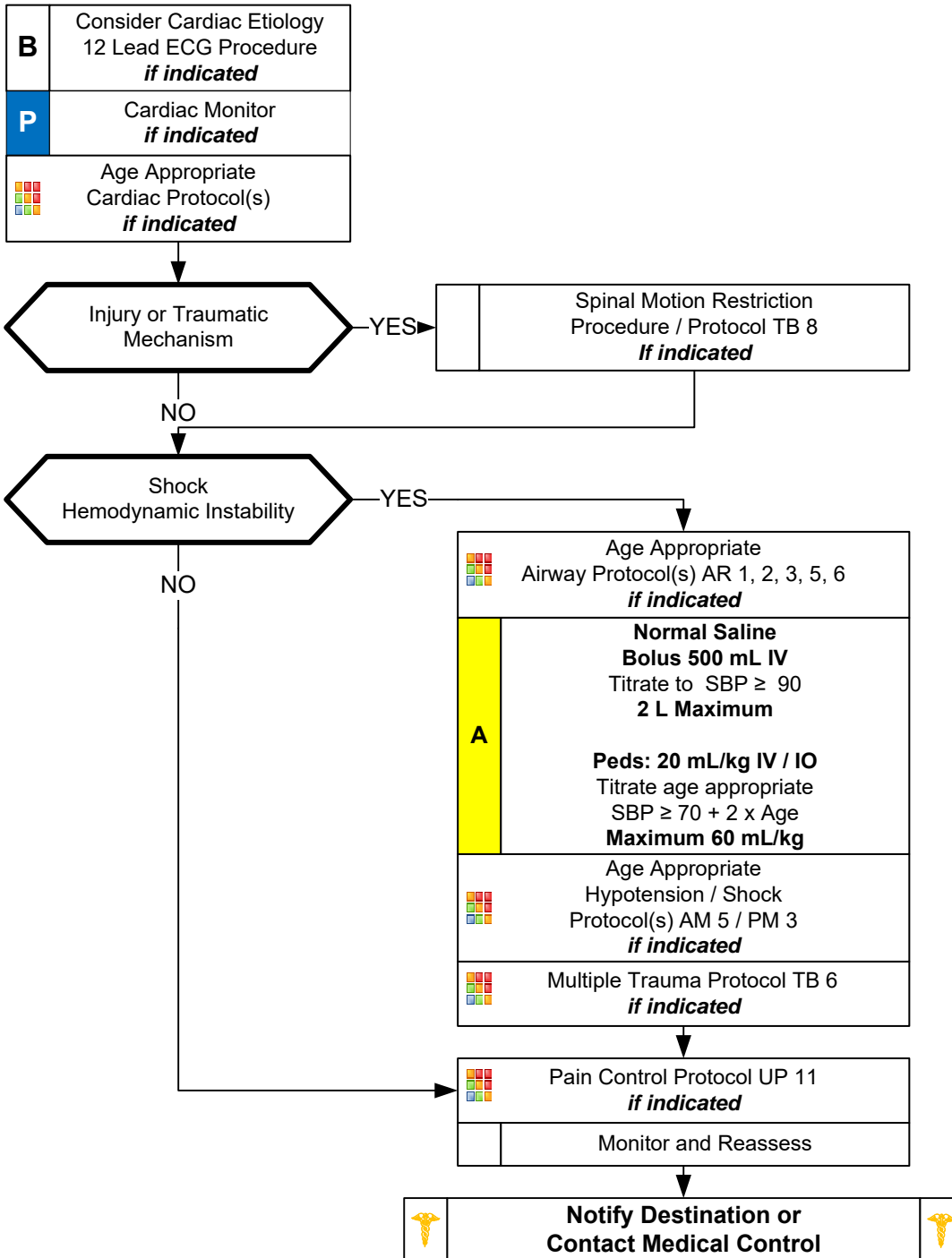
- Age
- Past medical history
- Past surgical history
- Medications
- Onset of pain / injury
- Previous back injury
- Traumatic mechanism
- Location of pain
- Fever
- Improvement or worsening with activity

## Signs and Symptoms

- Pain (paraspinous, spinous process)
- Swelling
- Pain with range of motion
- Extremity weakness
- Extremity numbness
- Shooting pain into an extremity
- Bowel / bladder dysfunction

## Differential

- Muscle spasm / strain
- Herniated disc with nerve compression
- Sciatica
- Spine fracture
- Kidney stone
- Pyelonephritis
- Aneurysm
- Pneumonia
- Spinal Epidural Abscess
- Metastatic Cancer
- AAA





# Back Pain



## Pearls

- **Recommended Exam: Mental Status, Heart, Lungs, Abdomen, Neuro, Lower extremity perfusion**
- **Back pain is one of the most common complaints in medicine and affects more than 90 % of adults at some point in their life. Back pain is also common in the pediatric population. Most often it is a benign process but in some circumstances can be life or limb threatening.**
- **Consider pregnancy or ectopic pregnancy with abdominal or back pain in women of childbearing age.**
- **Consider abdominal aortic aneurysm with abdominal pain especially in patients over 50 and/or patients with shock/ poor perfusion. Patients may have abdominal pain and / or lower extremity pain with diminished pulses, . Notify receiving facility early with suspected abdominal aneurysm.**
- **Consider cardiac etiology in patients > 50, diabetics and / or women especially with upper abdominal complaints.**
- **Red Flags which may signal more serious process associated with back pain:**
  - Age > 50 or < 18
  - Neurological deficit (leg weakness, urinary retention, or bowel incontinence)
  - IV Drug use
  - Fever
  - History of cancer, either current or remote
  - Night time pain in pediatric patients
- **Cauda equina syndrome is where the terminal nerves of spinal cord are being compressed (Symptoms include):**
  - Saddle anesthesia
  - Recent onset of bladder and bowel dysfunction. (Urine retention and bowel incontinence)
  - Severe or progressive neurological deficit in the lower extremity.
  - Motor weakness of thigh muscles or foot drop
- **Back pain associated with infection:**
  - Fever / chills.
  - IV Drug user (consider spinal epidural abscess)
  - Recent bacterial infection like pneumonia.
  - Immune suppression such as HIV or patients on chronic steroids like prednisone.
  - Meningitis.
- **Spinal motion restriction in patients with underlying spinal deformity should be maintained in their functional position.**
- **Kidney stones typically present with an acute onset of flank pain which radiates around to the groin area.**

## Disposition:

<b>EMS Transport:</b>	<b>ALS:</b>	Patient with abnormal vital signs, age > 50, any sensory or motor deficit associated with traumatic mechanism.
	<b>BLS:</b>	New abnormal extremity sensation or weakness. Normal sensory or motor exam associated with traumatic mechanism.
<b>MD Within 4 hours:</b>		Patients with chronic back pain with unchanged exam per patient (or patient records), no history of trauma with normal gait or as otherwise directed by paramedic-MD consult.



# Behavioral



## History

- Situational crisis
- Psychiatric illness/medications
- Injury to self or threats to others
- Medic alert tag
- Substance abuse / overdose
- Diabetes

## Signs and Symptoms

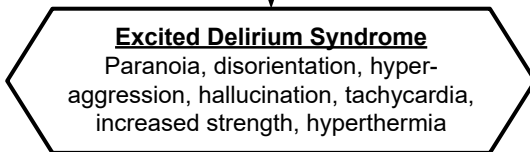
- Anxiety, agitation, confusion
- Affect change, hallucinations
- Delusional thoughts, bizarre behavior
- Combative violent
- Expression of suicidal / homicidal thoughts

## Differential

- Altered Mental Status differential
- Alcohol Intoxication
- Toxin / Substance abuse
- Medication effect / overdose
- Withdrawal syndromes
- Depression
- Bipolar (manic-depressive)
- Schizophrenia
- Anxiety disorders

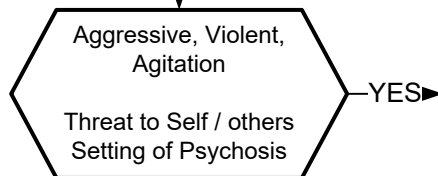
	Blood Glucose Analysis Procedure <i>if indicated</i>
	Age Appropriate Diabetic Protocol AM 3 / PM 2 if indicated
	Altered Mental Status Protocol UP 4 Overdose / Toxic Ingestion Protocol TE 7 if indicated
	Head Trauma Protocol TB 5 Multiple Trauma Protocol TB 6 if indicated

Call for help / additional resources  
Stage until scene safe



YES

NO



YES

NO

<b>P</b>	Evaluation and Screening Mental Health and Substance Use Protocol CIT Paramedic Only <i>if available</i>
	<b>Triage and Alternative Destination Mental Health / Substance Abuse</b> <i>If available</i>

	Consider Restraint Physical Procedure Monitor per restraint procedure <i>if indicated</i>
<b>A</b>	IV / IO Procedure
<b>P</b>	<p><u>Age ≥ 12</u> <b>Haloperidol 2 - 5 mg IM</b> <u>Age ≥ 65</u> <b>2.5 mg IM</b> May repeat every 5 min as needed <b>Maximum 10 mg</b></p> <p><b>Midazolam 2.5 mg IV / IO / IN</b> <b>5 mg IM</b> <u>Age ≥ 65</u> <b>0.5 - 1 mg IV / IO / IN</b> <b>2.5 mg IM</b> <b>Peds: 0.1 - 0.2 mg/kg IV / IO / IM / IN</b> Repeat every 2-3 minutes as needed <b>Adult Maximum: 5 mg</b> <b>Pediatric Maximum: 2 mg</b></p>
	Monitor and Reassess

<b>P</b>	<b>Midazolam 2.5 mg IV / IO / IN</b> <b>5 mg IM</b> <u>Age ≥ 65</u> <b>0.5 - 1 mg IV / IO / IN</b> <b>2.5 mg IM</b> <b>Peds: 0.1 - 0.2 mg/kg IV / IO / IM / IN</b> Repeat every 2-3 minutes as needed <b>Adult Maximum: 5 mg</b> <b>Pediatric Maximum: 2 mg</b>
<b>A</b>	IV / IO Procedure Preferably 2 large bore  <b>Normal Saline 1 L Bolus</b> Then <b>150 - 200 mL / hr</b> May repeat <b>500 mL Bolus</b> as needed <b>Maximum 2 L</b> <b>Peds: 20 - 60 mL/kg IV / IO</b> <b>Maximum 60 mL/kg</b>
	External Cooling Measures
	Consider Restraint Physical Procedure
	Monitor per restraint procedure <i>if indicated</i>
<b>P</b>	Cardiac Monitor



Notify Destination or  
Contact Medical Control



Universal Protocol Section





# Behavioral



## Scene safety:

- First priority is safety of on scene personnel. Protect yourself and others by requesting law enforcement. Do not approach patient if armed with any type weapon or reasonable suspicion of weapon. Retreat from scene to safe staging area if scene is or becomes unsafe at any point.

## General:

- Behavioral emergencies may be precipitated by an underlying medical condition even with known psychiatric disease.
- Be vigilant in your assessment to make sure an underlying medical condition is not the cause, but assume medical condition is precipitating cause.
- Psychosis may include head trauma, hypoglycemia, acute intoxication, sepsis, CNS insult, hypoxia and ingestions. Psychosis and delirium may be very difficult to distinguish. Search patient to ensure no weapons even if law enforcement has done so.

## Use SAFER model:

- Stabilize the situation by containing and lowering the stimuli (remove unnecessary personnel, remove patient from stress, reassure, calm and establish rapport.) Position yourself between patient and an exit.
- Keep hands in front of your body (non-threatening posture.) Only one provider should communicate with patient. Outline the patient's choices and calmly set some boundaries of acceptable behavior.
- Assess and acknowledge crisis
- Facilitate resources (Friends, family, police, chaplain)
- Encourage patient to use resources available and take actions in their best interest
- Recovery or referral: Patient in care of responsible person, professional or transport to medical facility.

## Restraints:

- Patient must be out of control and posing a threat to themselves or others.
- Use minimum necessary force required for patient control must be done in a way not to inflict harm upon the patient.
- Position of patient must not impede airway or breathing. This should be done supine or lateral with one arm raised above the head.
- Restraints must not impede circulation. Do not restrain patient in prone position. Do not allow patient to continue to struggle against restraint: This can cause life threatening condition. Contact Medical Control if necessary for
- Chemical restraint advice.

## Chemical Restraint:

- Patient must be out of control and posing a threat to themselves others.
- Necessary force required for patient control must be done in a way not to inflict harm upon the patient.
- Position of patient must not impede airway or breathing. This should be done supine or lateral with one arm raised above the head.
- Drug must be able to be given without imparting harm to rescuers or patient.

## Intranasal Midazolam Dose:

- Mix **5 mg of Midazolam in 1 mL of NS**
- **Pediatric 0.2 mg/kg IN ( If  $\geq 26$  kg give 5 mg )**



# Behavioral



## Pearls

- **Recommended Exam: Mental Status, Skin, Heart, Lungs, Neuro**
- **Crew / responders safety is the main priority.**
- **Any patient who is handcuffed or restrained by Law Enforcement and transported by EMS must be accompanied by law enforcement in the ambulance.**
- **Consider Haldol or Ziprasidone for patients with history of psychosis or a benzodiazepine for patients with presumed substance abuse.**
- **Haldol is acceptable treatment in pediatric patients  $\geq 12$  years old. Safety and efficacy is not established in younger ages.**
- **All patients who receive either physical or chemical restraint must be continuously observed by ALS personnel on scene or immediately upon their arrival.**
- Be sure to consider all possible medical/trauma causes for behavior (hypoglycemia, overdose, substance abuse, hypoxia, head injury, etc.)
- Do not irritate the patient with a prolonged exam.
- Do not overlook the possibility of associated domestic violence, child, or geriatric abuse.
- Do not position or transport any restrained patient in such a way that could impact the patient's respiratory or circulatory status.
- **Excited Delirium Syndrome:**  
Medical emergency: Combination of delirium, psychomotor agitation, anxiety, hallucinations, speech disturbances, disorientation, violent / bizarre behavior, insensitivity to pain, hyperthermia and increased strength. Potentially life-threatening and associated with use of physical control measures, including physical restraints and Tasers. Most commonly seen in male subjects with a history of serious mental illness and/or acute or chronic drug abuse, particularly stimulant drugs such as cocaine, crack cocaine, methamphetamine, amphetamines or similar agents. Alcohol withdrawal or head trauma may also contribute to the condition.
- **If patient is suspected of EDS suffers cardiac arrest, consider a fluid bolus and sodium bicarbonate early**
- **Extrapyramidal reactions:**  
Condition causing involuntary muscle movements or spasms typically of the face, neck and upper extremities. May present with contorted neck and trunk with difficult motor movements. Typically an adverse reaction to antipsychotic drugs like Haloperidol and may occur with your administration. When recognized give **Diphenhydramine 50 mg IV / IO / IM / PO** in adults or **1 mg/kg IV / IO / IM / PO** in pediatrics.
- **May add page 3 to protocol for specific for local mental health and / or substance misuse resources or destinations.**

## Disposition:

**EMS Transport: ALS:** All restrained patients or patients who receive ALS care  
**BLS:** All other patients

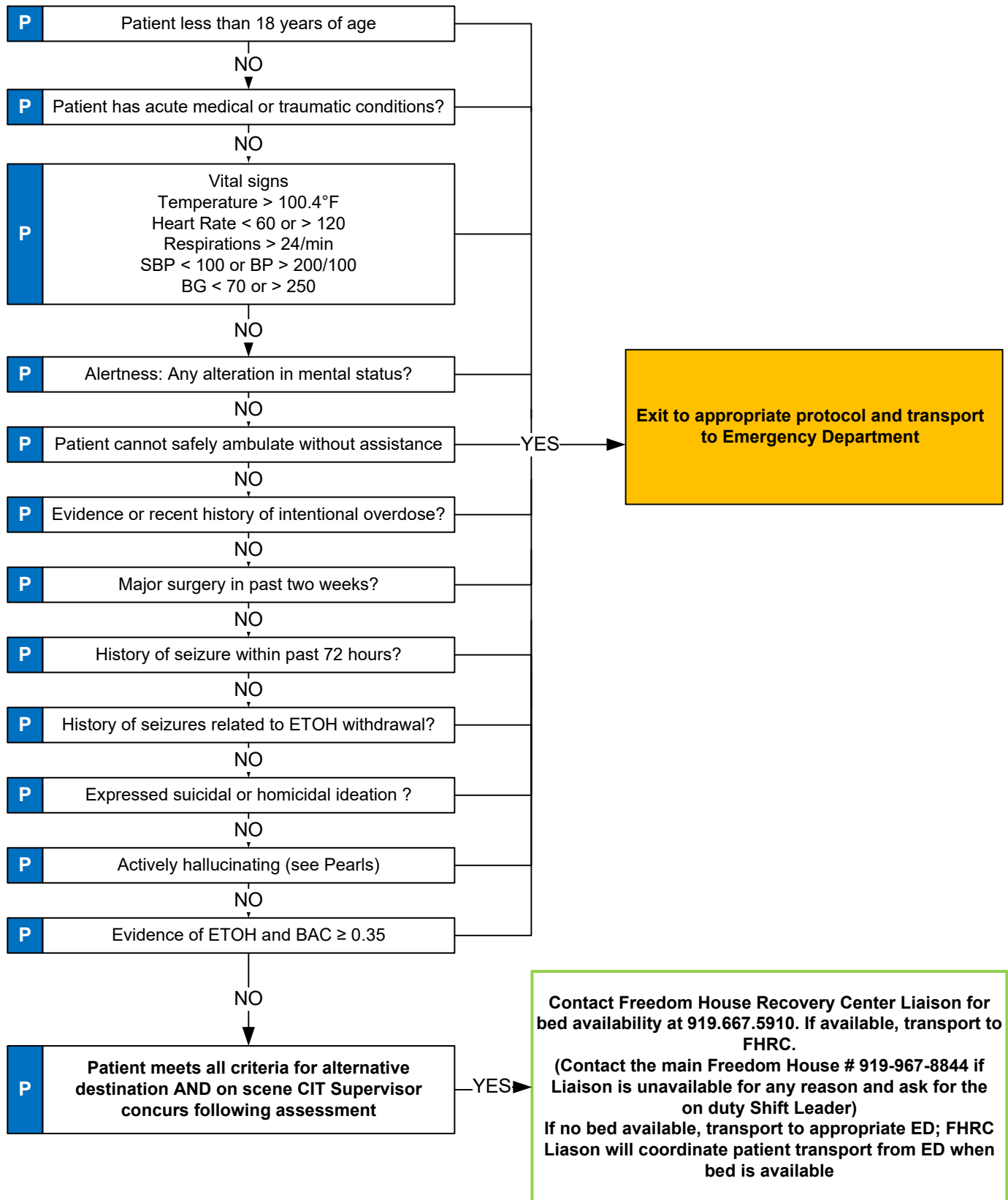
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# Mental Health and Substance Abuse Diversion



Entry from Behavioral Emergencies or Inebriated Person Protocols AND patient agrees with transport to alternative destination





# Mental Health and Substance Abuse Diversion



## Pearls

- Medics considering alternative destination transport must request an EMS Supervisor Response. This request should be made early.
- Only patients who have been given a BAC test may be transported to the alternative destination
- Patients being transported to Freedom House should be advised to bring all prescription medications with them
- Pregnant patients needing opioid replacement therapy to avoid withdrawal should be transported to UNC Main Campus or Duke ED.
- Any patient expressing homicidal or suicidal plan or intent should be transported to UNC Main Campus or Duke ED.
- Unstable bulimia or anorexia patients may not be transported to alternative destination
- Patients who are undergoing involuntary commitment must go to UNC Main Campus or Duke ED
- Patients must agree with decision to transport to alternative destination.
- Consult medical control if patient has history of chronic hallucinations and the patient has a care giver present who can attest to the base line of the patient.
- Be on the lookout for patients that have taken excessive amounts of Tylenol (greater 4 grams/day) as this can be a life threatening overdose with very few, if any, early symptoms.
- If a patient has taken medications outside of normal dose, the Paramedic will contact Poison Control (800-222- 1222). When calling, the Paramedic should be prepared with the information outlined in Policy 27 (State Poison Center).
- Transport and/or treatment is a team effort

## Disposition:

EMS Transport: **ALS:** All patients going to the alternative destination

**Contact Medical Control:** If patient has alternative means of transportation to alternative destination **AND** meets all criteria for alternative destination

## Protocol 7

Any local EMS System changes to this document must follow the NC OEMS Protocol Change Policy and be approved by OEMS



# Dental Problems



## History

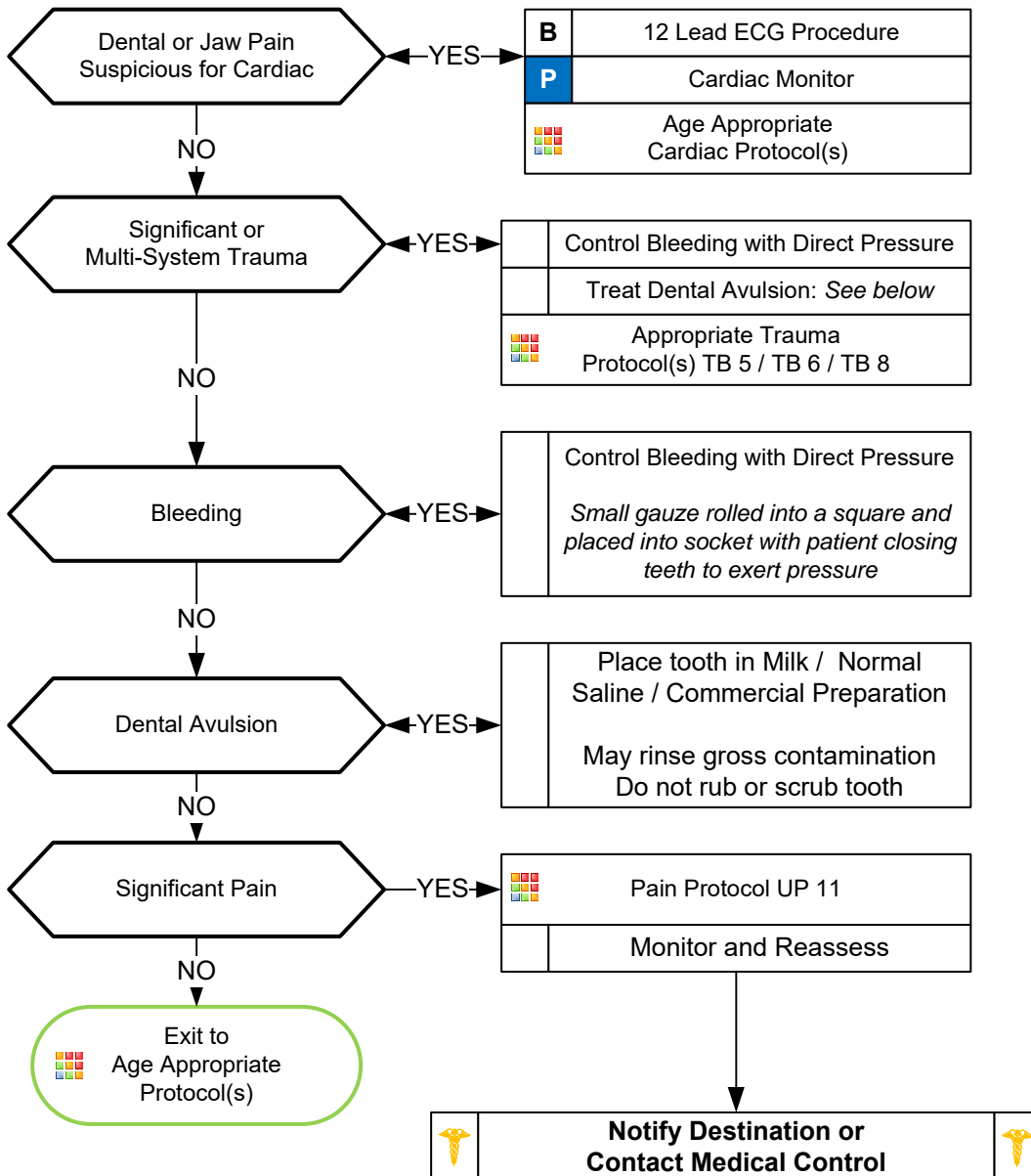
- Age
- Past medical history
- Medications
- Onset of pain / injury
- Trauma with "knocked out" tooth
- Location of tooth
- Whole vs. partial tooth injury

## Signs and Symptoms

- Bleeding
- Pain
- Fever
- Swelling
- Tooth missing or fractured

## Differential

- Decay
- Infection
- Fracture
- Avulsion
- Abscess
- Facial cellulitis
- Impacted tooth (wisdom)
- TMJ syndrome
- Myocardial infarction



Universal Protocol Section

## Pearls

- **Recommended Exam: Mental Status, HEENT, Neck, Chest, Lungs, Neuro**
- Significant soft tissue swelling to the face or oral cavity can represent a cellulitis or abscess.
- Scene and transport times should be minimized in complete tooth avulsions. Replantation is possible within 4 hours if the tooth is properly cared for.
- Occasionally cardiac chest pain can radiate to the jaw.
- All pain associated with teeth should be associated with a tooth which is tender to tapping or touch (or sensitivity to cold or hot).



# Dental Problems



## Notes:

Universal Protocol Section

### Pearls

- **Recommended Exam: Mental Status, HEENT, Neck, Chest, Lungs, Neuro**
- Significant soft tissue swelling to the face or oral cavity can represent a cellulitis or abscess.
- Scene and transport times should be minimized in complete tooth avulsions. Reimplantation is possible within 4 hours if the tooth is properly cared for.
- Occasionally cardiac chest pain can radiate to the jaw.
- All pain associated with teeth should be associated with a tooth which is tender to tapping or touch (or sensitivity to cold or hot).

### Disposition:

#### EMS Transport:

**ALS:** Significant soft tissue swelling with potential airway obstruction, atypical pain possibly related to referred cardiac pain

**BLS:** Significant soft tissue swelling or tooth avulsion within 4 hour time frame and no available transportation

**DDS Within 4 Hours:** Isolated tooth problem, minimal soft tissue swelling, normal exam otherwise.

**DDS Within 24 Hours:** No detected abnormality other than tooth pain.



# Emergencies Involving Indwelling Central Lines



## History

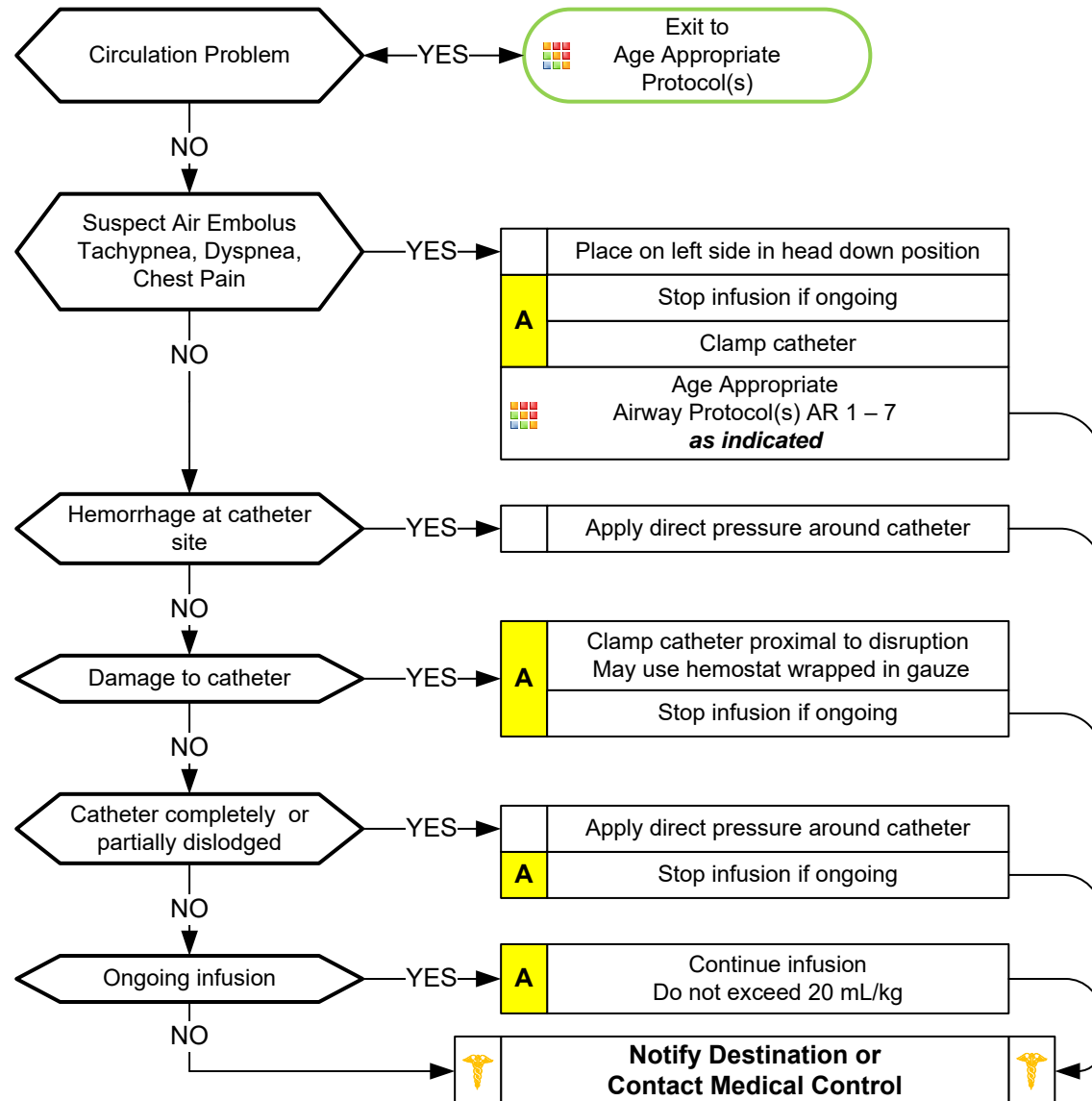
- Central Venous Catheter Type
  - Tunneled Catheter (Broviac / Hickman)
- PICC (peripherally inserted central catheter)
- Implanted catheter (Mediport / Hickman)
- Occlusion of line
- Complete or partial dislodge
- Complete or partial disruption

## Signs and Symptoms

- External catheter dislodgement
- Complete catheter dislodgement
- Damaged catheter
- Bleeding at catheter site
- Internal bleeding
- Blood clot
- Air embolus
- Erythema, warmth or drainage about catheter site indicating infection

## Differential

- Fever
- Hemorrhage
- Reactions from home nutrient or medication
- Respiratory distress
- Shock



## Pearls

- **Always talk to family / caregivers as they have specific knowledge and skills.**
- **Use strict sterile technique when accessing / manipulating an indwelling catheter.**
- **Cardiac arrest: May access central catheter and utilize if functioning properly.**
- Do not place a tourniquet or BP cuff on the same side where a PICC line is located.
- Do not attempt to force catheter open if occlusion evident.
- Some infusions may be detrimental to stop. Ask family or caregiver if it is appropriate to stop or change infusion.
- Hyperalimentation infusions (IV nutrition): If stopped for any reason monitor for hypoglycemia.



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# Epistaxis



## History

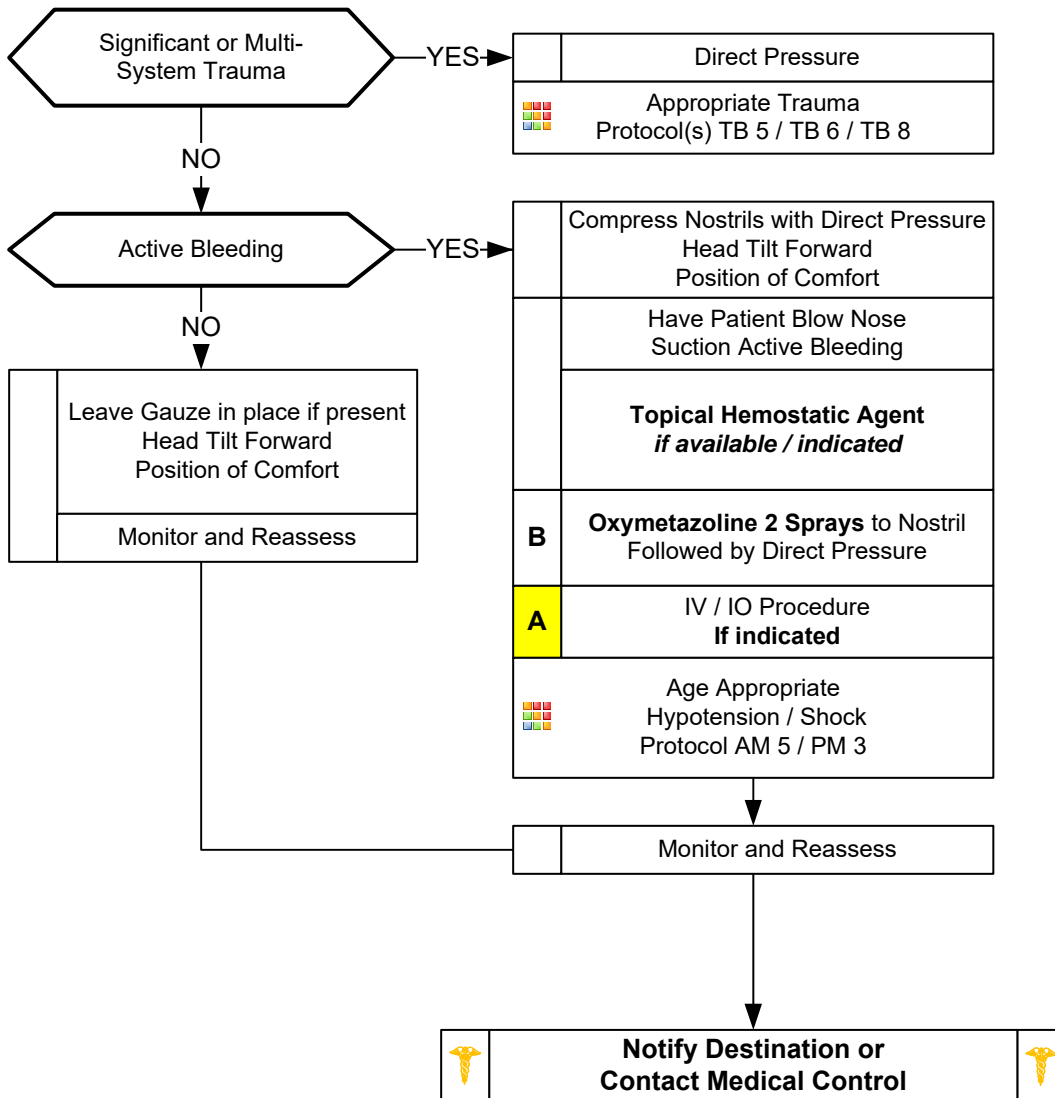
- Age
- Past medical history
- Medications (HTN, anticoagulants, aspirin, NSAIDs)
- Previous episodes of epistaxis
- Trauma
- Duration of bleeding
- Quantity of bleeding

## Signs and Symptoms

- Bleeding from nasal passage
- Pain
- Nausea
- Vomiting

## Differential

- Trauma
- Infection (viral URI or Sinusitis)
- Allergic rhinitis
- Lesions (polyps, ulcers)
- Hypertension





# Epistaxis



## Notes:

Universal Protocol Section

### Pearls

- **Recommended Exam: Mental Status, HEENT, Heart, Lungs, Neuro**
- **Age specific hypotension: 0 – 28 days < 60 mmHg, 1 month – 1 year < 70 mmHg, 1 year – 10 years < 70 + ( 2 x age)mmHg, 11 years and greater < 90 mmHg.**
- It is very difficult to quantify the amount of blood loss with epistaxis.
- Bleeding may also be occurring posteriorly. Evaluate for posterior blood loss by examining the posterior pharynx.
- Anticoagulants include warfarin (Coumadin), Apixaban (Eliquis), heparin, enoxaparin (Lovenox), dabigatran (Pradaxa), rivaroxaban (Xarelto), and many over the counter headache relief powders.
- Anti-platelet agents like aspirin, clopidogrel (Plavix), aspirin/dipyridamole (Aggrenox), and ticlopidine (Ticlid) can contribute to bleeding.

### Disposition:

<b>EMS Transport:</b>	<b>ALS:</b> All patients with orthostatic changes or elevated diastolic BP of > 110 or any airway concerns, any profuse uncontrolled bleeding
	<b>BLS:</b> Patient taking anticoagulants or anti-platelet medication. Any minor continued bleeding despite Afrin and no orthostatic changes.
<b>MD Within 4 Hours:</b>	Resolved epistaxis unless otherwise directed by paramedic-personal MD consultation.



# Fever / Infection Control



## History

- Age
- Duration of fever
- Severity of fever
- Past medical history
- Medications
- Immunocompromised (transplant, HIV, diabetes, cancer)
- Environmental exposure
- Last acetaminophen or ibuprofen

## Signs and Symptoms

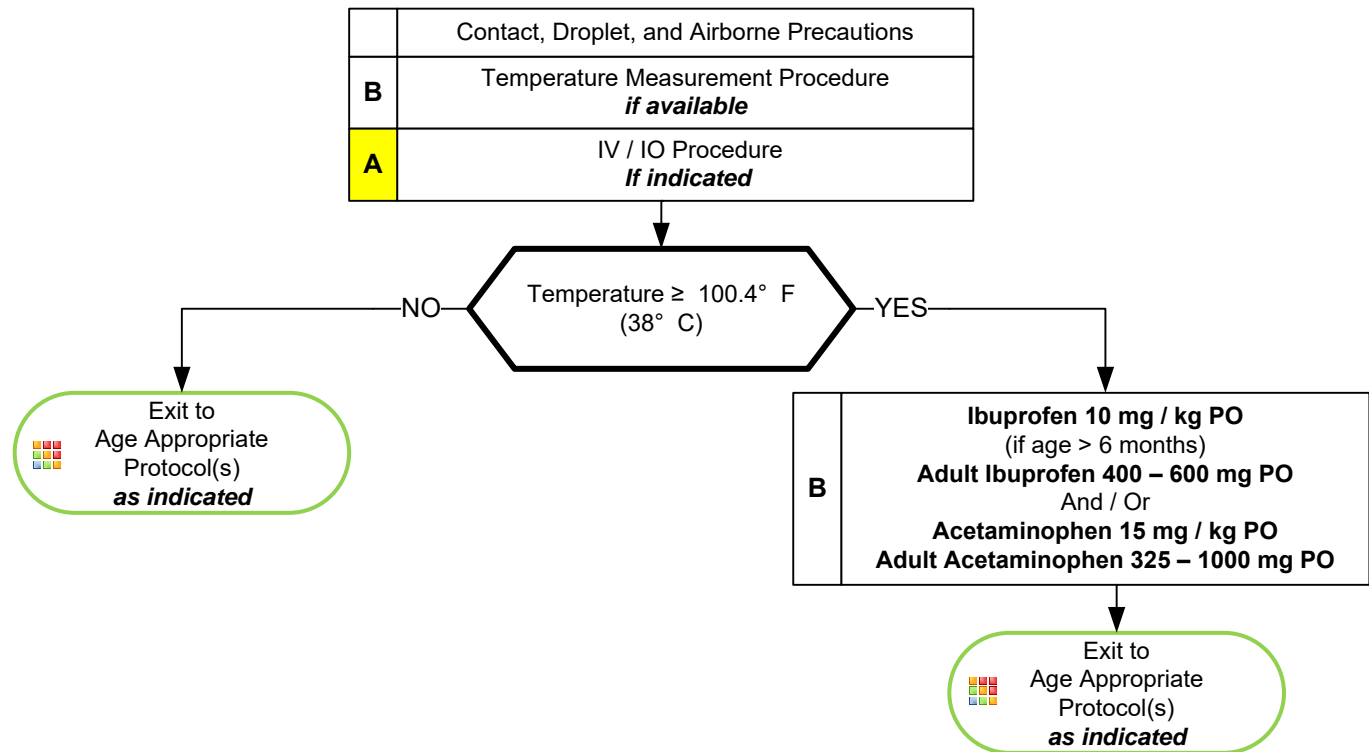
- Warm
- Flushed
- Sweaty
- Chills/Rigors

### Associated Symptoms (Helpful to localize source)

- myalgias, cough, chest pain, headache, dysuria, abdominal pain, mental status changes, rash

## Differential

- Infections / Sepsis
- Cancer / Tumors / Lymphomas
- Medication or drug reaction
- Connective tissue disease
  - Arthritis
  - Vasculitis
- Hyperthyroidism
- Heat Stroke
- Meningitis



Universal Protocol Section



# Fever / Infection Control



## Notes:

### Pearls

- **Recommended Exam: Mental Status, Skin, HEENT, Neck, Heart, Lungs, Abdomen, Back, Extremities, Neuro**
- Febrile seizures are more likely in children with a history of febrile seizures and with a rapid elevation in temperature.
- Patients with a history of liver failure should not receive acetaminophen.
- **Droplet precautions** include standard PPE plus a standard surgical mask for providers who accompany patients in the back of the ambulance and a surgical mask or NRB O2 mask for the patient. This level of precaution should be utilized when influenza, meningitis, mumps, streptococcal pharyngitis, and other illnesses spread via large particle droplets are suspected. A patient with a potentially infectious rash should be treated with droplet precautions.
- **Airborne precautions** include standard PPE plus utilization of a gown, change of gloves after every patient contact, and strict hand washing precautions. This level of precaution is utilized when multi-drug resistant organisms (e.g. MRSA), scabies, or zoster (shingles), or other illnesses spread by contact are suspected.
- **All-hazards precautions** include standard PPE plus airborne precautions plus contact precautions. This level of precaution is utilized during the initial phases of an outbreak when the etiology of the infection is unknown or when the causative agent is found to be highly contagious (e.g. SARS).
- Rehydration with fluids increases the patient's ability to sweat and improves heat loss.
- All patients should have drug allergies documented prior to administering pain medications.
- Allergies to NSAIDs (non-steroidal anti-inflammatory medications) are a contraindication to Ibuprofen. Do not give to patients who have renal disease or renal transplant.
- NSAIDs should not be used in the setting of environmental heat emergencies.
- **Do not** give aspirin to a child, age  $\leq 15$  years.
- Agency Medical Director may require contact of medical control prior to EMT / EMR administering any medication.

### Disposition:

<b>EMS Transport:</b>	<b>ALS:</b>	Patients with pulse oximetry $< 94\%$ on room air, ALS transport otherwise based on specific protocol.
	<b>BLS:</b>	Age $< 1$ or $> 65$ , pulse oximetry $> 94\%$
<b>MD Within 4 Hours:</b>	Age $> 1$ and $< 65$ with normal vital signs, not prescribed or currently taking immunosuppressive medications, and pulse ox $> 96\%$	



# Pain Control



## History

- Age
- Location
- Duration
- Severity (1 - 10)
- If child use Wong-Baker faces scale
- Past medical history
- Medications
- Drug allergies

## Signs and Symptoms

- Severity (pain scale)
- Quality (sharp, dull, etc.)
- Radiation
- Relation to movement, respiration
- Increased with palpation of area

## Differential

- Per the specific protocol
- Musculoskeletal
- Visceral (abdominal)
- Cardiac
- Pleural / Respiratory
- Neurogenic
- Renal (colic)

Enter from  
Protocol based on **Specific Complaint**



## Assess Pain Severity

Use combination of Pain Scale,  
Circumstances, MOI, Injury or  
Illness severity

Mild

Moderate to Severe

B	<b>Ibuprofen 10 mg/kg PO</b> (400 – 600 mg typical adult) Maximum 800 mg Or <b>Acetaminophen 15 mg/kg</b> (325 – 1000 mg typical adult) Maximum 1000 mg Or <b>Aspirin 324 to 650 mg PO</b> (≥ 16 only)
	Consider IV Procedure <i>if indicated</i>

A	IV / IO Procedure
	<b>Ketorolac 15mg IV/IO/IM</b> May repeat in 10 minutes Max 30mg Peds: 0.5mg/kg IV/IO/IM Max 15mg
P	Cardiac Monitor
	<b>Fentanyl 50 mcg (0.25-1 mcg/kg) IM/IV/IO/IN</b> 25-50 mcg may be repeated at in 5 minutes as needed. If age ≥ 60 give 0.5 mcg/kg Maximum 200 mcg Peds: Fentanyl 0.5-1 mcg/kg IV/IO/IN May be repeated at 0.5 mcg/kg in 5 minutes as needed. Peds: Maximum 200 mcg Or <b>Morphine 4 mg (0.1 mg/kg) IV / IO</b> Repeat 4 mg every 5 minutes as needed. Maximum 12 mg Peds: Morphine 0.1 mg/kg IV / IO / IM May repeat every 5 minutes Peds Maximum single dose 2 mg Maximum total dose 10 mg
	Monitor and Reassess Every 10 minutes following sedative

Monitor and Reassess

Notify Destination or  
Contact Medical Control

Universal Protocol Section



# Pain Control



## Pearls

- **Recommended Exam: Mental Status, Area of Pain, Neuro**
- **Pain severity (0-10) is a vital sign to be recorded before and after PO, IV, IO or IM medication delivery and at patient hand off. Monitor BP closely as sedative and pain control agents may cause hypotension.**
- **Both arms of the treatment may be used in concert. For patients in Moderate pain for instance, you may use the combination of an oral medication and parenteral if no contraindications are present.**
- **Pediatrics:**
- For children use Wong-Baker faces scale or the FLACC score (see Assessment Pain Procedure)
- Use Numeric (> 9 yrs), Wong-Baker faces (4-16yrs) or FLACC scale (0-7 yrs) as needed to assess pain
- **Vital signs should be obtained before, 10 minutes after, and at patient hand off with all pain medications.**
- All patients who receive IM or IV medications must be observed 15 minutes for drug reaction in the event no transport occurs.
- Do not administer any PO medications for patients who may need surgical intervention such as open fractures or fracture deformities, headaches, or abdominal pain.
- **Ketorolac (Toradol) and Ibuprofen should not be used in patients with known renal disease or renal transplant, in patients who have known drug allergies to NSAID's (non-steroidal anti-inflammatory medications), with active bleeding, headaches, abdominal pain, stomach ulcers or in patients who may need surgical intervention such as open fractures or fracture deformities.**
- Do not administer **Acetaminophen** to patients with a history of liver disease.
- Burn patients may required higher than usual opioid doses to titrate adequate pain control.
- For adult patients with significant burns involving > 15% BSA:
  - Maximum Fentanyl 300 mcg**
  - Maximum Morphine 20 mg**
- Consider agency-specific anti-emetic(s) for nausea and/or vomiting.



# Police Custody



## History

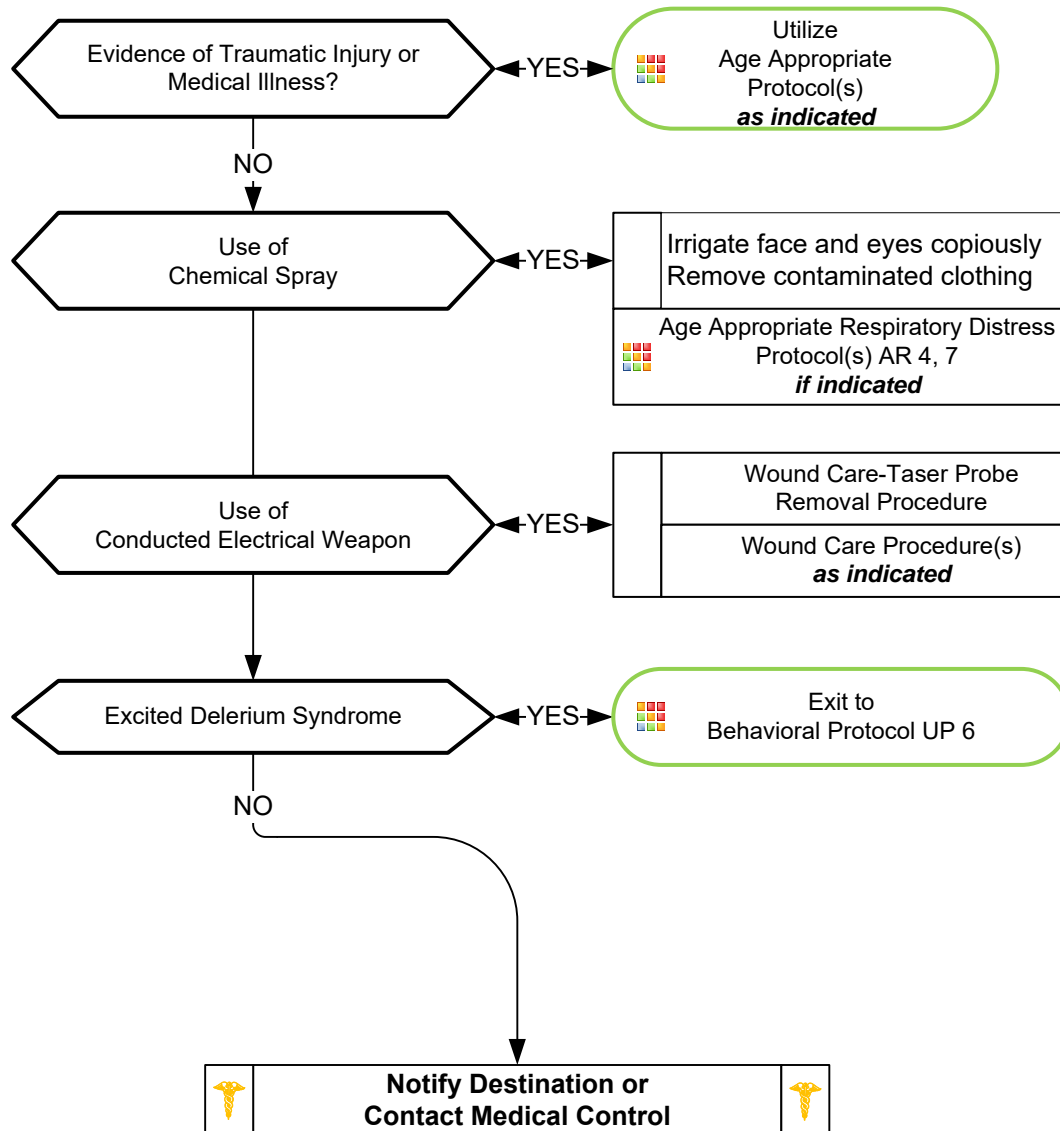
- Traumatic Injury
- Drug Abuse
- Cardiac History
- History of Asthma
- Psychiatric History

## Signs and Symptoms

- External signs of trauma
- Palpitations
- Shortness of breath
- Wheezing
- Altered Mental Status
- Intoxication/Substance Abuse

## Differential

- Agitated Delirium Secondary to Psychiatric Illness
- Agitated Delirium Secondary to Substance Abuse
- Traumatic Injury
- Closed Head Injury
- Asthma Exacerbation
- Cardiac Dysrhythmia



Universal Protocol Section





# Police Custody



## Pearls

- **Patient does not have to be in police custody or under arrest to utilize this protocol.**
- **Local EMS agencies should formulate a policy with local law enforcement agencies concerning patients requiring EMS and Law Enforcement simultaneously. Agencies should work together to formulate a disposition in the best interest of the patient.**
- **Patients restrained by law enforcement devices must be transported accompanied by a law enforcement officer in the patient compartment who is capable of removing the devices. However when rescuers have utilized restraints in accordance with Restraint Procedure, the law enforcement agent may follow behind the ambulance during transport.**
- **All patients who receive either physical or chemical restraint must be continuously observed by ALS personnel on scene or immediately upon their arrival.**
- The responsibility for patient care rests with the highest authorized medical provider on scene per North Carolina law.
- If an asthmatic patient is exposed to pepper spray and released to law enforcement, all parties should be advised to immediately contact EMS if wheezing/difficulty breathing occurs.
- All patients with decision-making capacity in police custody retain the right to participate in decision making regarding their care and may request care or refuse care of EMS.
- If extremity / chemical / law enforcement restraints are applied, follow Restraint Procedure.
- **Consider Haldol or Ziprasidone for patients with history of psychosis or a benzodiazepine for patients with presumed substance abuse.**
- **Haldol is acceptable treatment in pediatric patients  $\geq 12$  years old. Safety and efficacy is not established in younger ages.**
- **Excited Delirium Syndrome:**  
Medical emergency: Combination of delirium, psychomotor agitation, anxiety, hallucinations, speech disturbances, disorientation, violent / bizarre behavior, insensitivity to pain, hyperthermia and increased strength. Potentially life-threatening and associated with use of physical control measures, including physical restraints and Tasers. Most commonly seen in male subjects with a history of serious mental illness and/or acute or chronic drug abuse, particularly stimulant drugs such as cocaine, crack cocaine, methamphetamine, amphetamines or similar agents. Alcohol withdrawal or head trauma may also contribute to the condition.  
**If patient suspected of EDS suffers cardiac arrest, consider a fluid bolus and sodium bicarbonate early.**
- Do not position or transport any restrained patient in such a way that could impact the patient's respiratory or circulatory status.
- Patients exposed to chemical spray, with or without history of respiratory disease, may develop respiratory complaints up to 20 minutes post exposure.



# Seizure



## History

- Reported / witnessed seizure activity
- Previous seizure history
- Medical alert tag information
- Seizure medications
- History of trauma
- History of diabetes
- History of pregnancy
- Time of seizure onset
- Document number of seizures
- Alcohol use, abuse or abrupt cessation
- Fever

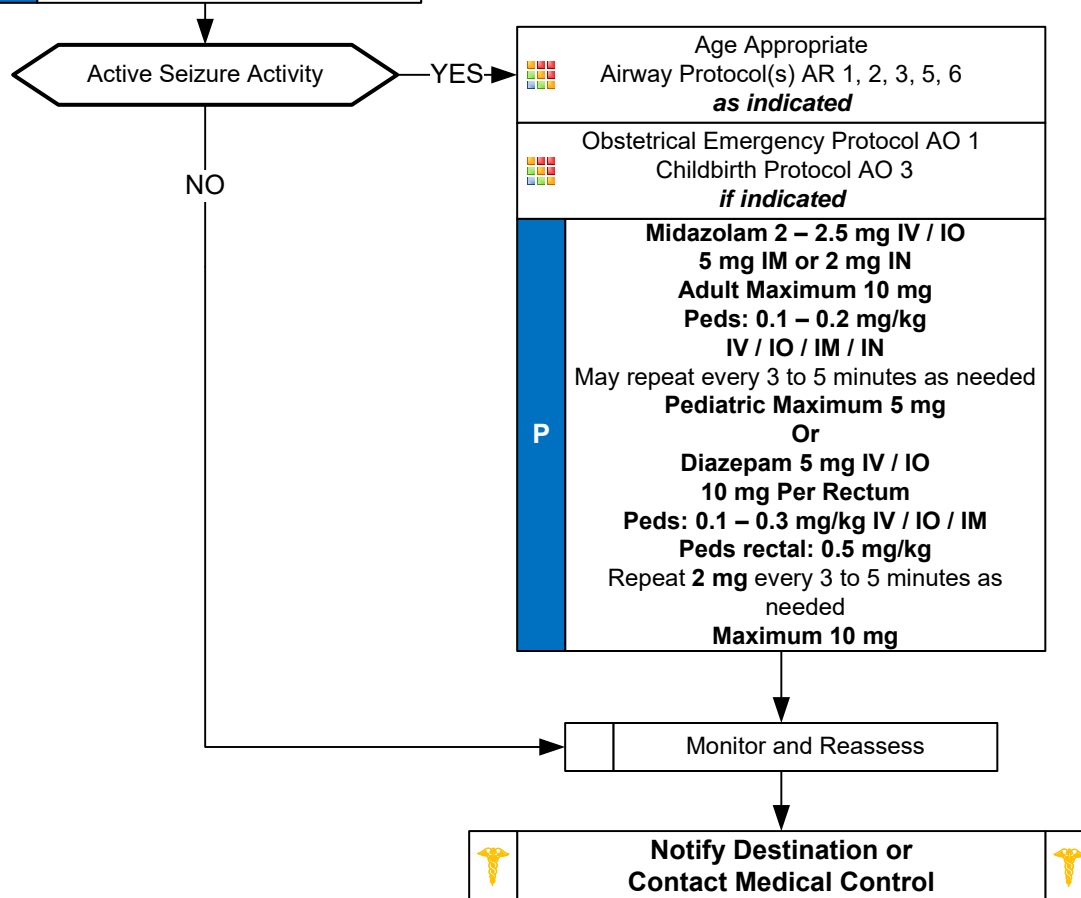
## Signs and Symptoms

- Decreased mental status
- Sleepiness
- Incontinence
- Observed seizure activity
- Evidence of trauma
- Unconscious

## Differential

- CNS (Head) trauma
- Tumor
- Metabolic, Hepatic, or Renal failure
- Hypoxia
- Electrolyte abnormality (Na, Ca, Mg)
- Drugs, Medications, Non-compliance
- Infection / Fever
- Alcohol withdrawal
- Eclampsia
- Stroke
- Hyperthermia
- Hypoglycemia

	Loosen any constrictive clothing Protect patient
	<b>Blood Glucose Analysis Procedure</b>
	Altered Mental Status Protocol UP 4 <b>if indicated</b>
	Behavioral Protocol UP 6 <b>if indicated</b>
<b>A</b>	IV / IO Procedure <b>if indicated</b>
<b>P</b>	Cardiac Monitor <b>if indicated</b>





# Seizure



## Pearls

- **Recommended Exam: Mental Status, HEENT, Heart, Lungs, Extremities, Neuro**
- **Items in Red Text are key performance measures used to evaluate protocol compliance and care**
- **Adult:**
  - **Midazolam 5 – 10 mg IM is effective in termination of seizures. Do not delay IM administration with difficult IV or IO access. IM Preferred over IO.**
- **Pediatrics:**
  - **Midazolam 0.2 mg/kg (Maximum 5 mg) IM is effective in termination of seizures. Do not delay IM administration with difficult IV or IO access. IM Preferred over IO.**
- **Status epilepticus** is defined as two or more successive seizures without a period of consciousness or recovery. This is a true emergency requiring rapid airway control, treatment, and transport.
- **Grand mal seizures (generalized)** are associated with loss of consciousness, incontinence, and tongue trauma.
- **Focal seizures** affect only a part of the body and are not usually associated with a loss of consciousness, but can propagate to generalized seizures with loss of consciousness.
- Be prepared for airway problems and continued seizures.
- Assess possibility of occult trauma and substance abuse.
- In an infant, a seizure may be the only evidence of a closed head injury.
- Be prepared to assist ventilations especially if diazepam or midazolam is used.
- For any seizure in a pregnant patient, follow the OB Emergencies Protocol.
- Diazepam (Valium) is not effective when administered IM. Give IV or Rectally.
- Midazolam is well absorbed when administered IM.

## Disposition:

### EMS Transport

**ALS:** All patients not cleared by medical control and not meeting criteria below  
**BLS:** Single seizure with return to baseline mental status with normal vital signs  
**No pediatric BLS disposition**

**MD Within 4 Hours:** Patient with previous seizure history, current seizure typical of history, and paramedic discussion with personal MD or Medical Control determines appropriateness of outpatient MD evaluation and there is a responsible adult present who will stay with the patient.



# Suspected Stroke



## History

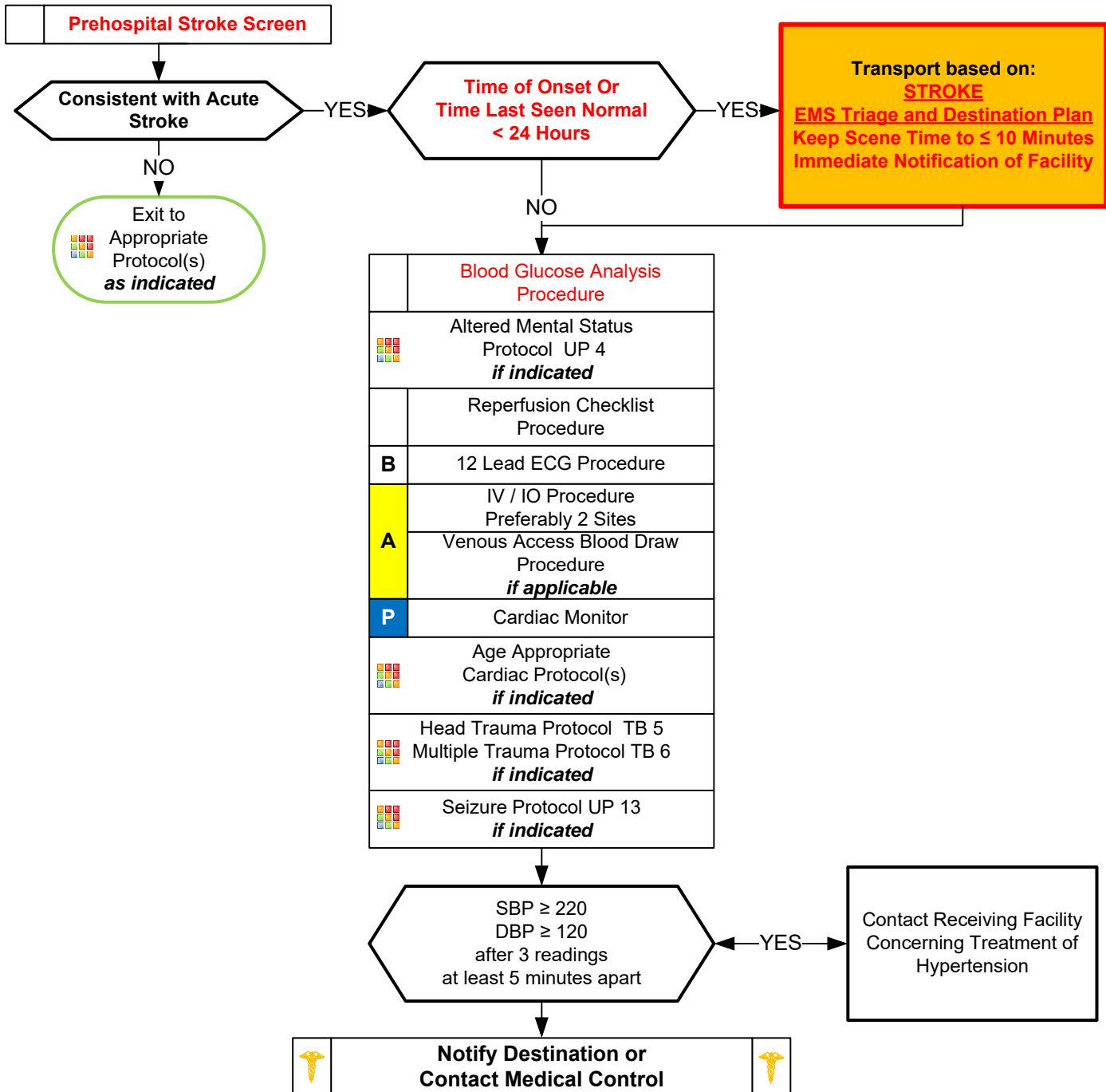
- Previous CVA, TIA's
- Previous cardiac / vascular surgery
- Associated diseases: diabetes, hypertension, CAD
- Atrial fibrillation
- Medications (blood thinners)
- History of trauma
- Sickle Cell Disease
- Immune disorders
- Congenital heart defects
- Maternal infection / hypertension

## Signs and Symptoms

- Altered mental status
- Weakness / Paralysis
- Blindness or other sensory loss
- Aphasia / Dysarthria
- Syncope
- Vertigo / Dizziness
- Vomiting
- Headache
- Seizures
- Respiratory pattern change
- Hypertension / hypotension

## Differential

- See Altered Mental Status
- TIA (Transient ischemic attack)
- Seizure
- Todd's Paralysis
- Hypoglycemia
- Stroke
  - Thrombotic or Embolic (~85%)
  - Hemorrhagic (~15%)
- Tumor
- Trauma
- Dialysis / Renal Failure



Universal Protocol Section



# Suspected Stroke



## Pearls

- **Recommended Exam: Mental Status, HEENT, Heart, Lungs, Abdomen, Extremities, Neuro**
- **Items in Red Text are key performance measures used in the EMS Acute Stroke Care Toolkit.**
- **Acute Stroke care is evolving rapidly. Time of onset / last seen normal may be changed at any time depending on the capabilities and resources of your hospital based on Stroke: EMS Triage and Destination Plan.**
- **Time of Onset or Last Seen Normal:**
  - One of the most important items the pre-hospital provider can obtain, of which all treatment decisions are based.**
  - Be very precise in gathering data to establish the time of onset and report as an actual time (i.e. 13:47 NOT “about 45 minutes ago.”)**
  - Without this information patient may not be able to receive thrombolytics at facility.**
  - Wake up stroke: Time starts when patient last awake or symptom free.**
- **You are often in the best position to determine the actual Time of Onset while you have family, friends or caretakers available. Often these sources of information may arrive well after you have delivered the patient to the hospital. Delays in decisions due to lack of information may prevent an eligible patient from receiving thrombolytics.**
- **The Reperfusion Checklist should be completed for any suspected stroke patient. With a duration of symptoms of **less than twenty-four (24) hours**, scene times should be limited to  $\leq 10$  minutes, early notification / activation of receiving facility should be performed and transport times should be minimized.**
- **If possible place 2 IV sites.**
- **Blood Draw:**
  - Many systems utilize EMS venous blood samples. Follow your local policy and procedures.**
- **The differential listed on the Altered Mental Status Protocol should also be considered.**
- **Be alert for airway problems (swallowing difficulty, vomiting/aspiration).**
- **Hypoglycemia can present as a localized neurologic deficit, especially in the elderly.**
- **Document the Stroke Screen results in the PCR.**
- **Agencies may use validated pre-hospital stroke screen of choice.**
- **Pediatrics:**
  - Strokes do occur in children, they are slightly more common in ages  $< 2$ , in boys, and in African-Americans.**
  - Newborn and infant symptoms consist of seizures, extreme sleepiness, and using only one side of the body.**
  - Children and teenagers symptoms may consist of severe headaches, vomiting, sleepiness, dizziness, and/or loss of balance or coordination.**

<b>Disposition:</b>	<b>EMS Transport:</b>	<b>ALS:</b> All patients other than listed below
		<b>BLS:</b> Hypoglycemia with normal exam post Dextrose



# Suspected Sepsis



## History

- Duration and severity of fever
- Past medical history
- Medications / Recent antibiotics
- Immunocompromised (transplant, HIV, diabetes, cancer)
- Indwelling medical device
- Last acetaminophen or ibuprofen
- Recent Hospital / healthcare facility
- Bedridden or immobile
- Elderly and very young – at risk
- Prosthetic device / indwelling device

## Signs and Symptoms

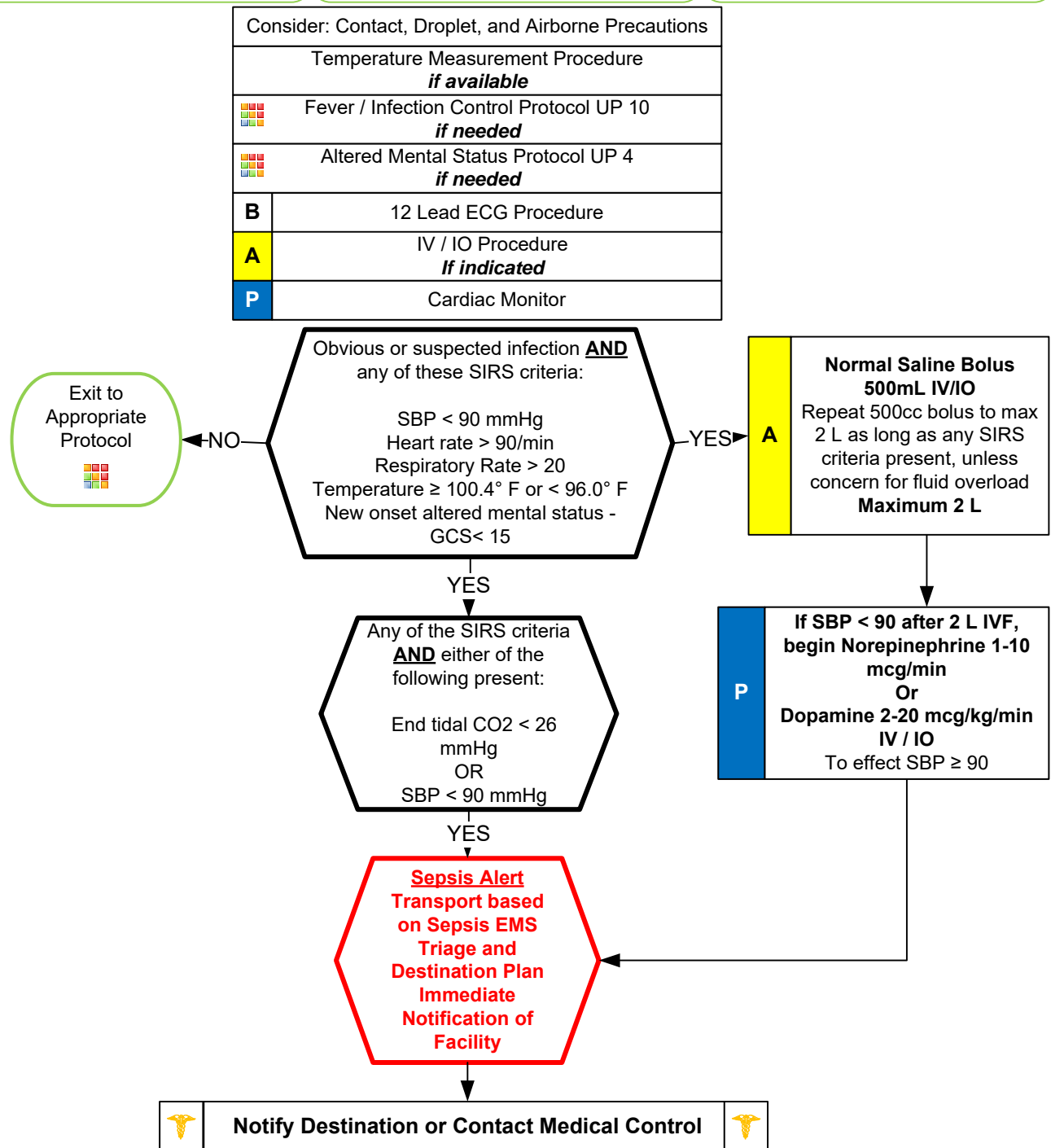
- Warm
- Flushed
- Sweaty
- Chills / Rigors
- Delayed cap refill
- Mental status changes

## Associated Symptoms (Helpful to localize source)

- myalgias, cough, chest pain, headache, dysuria, abdominal pain, rash

## Differential

- Infections: UTI, Pneumonia, skin/wound
- Cancer / Tumors / Lymphomas
- Medication or drug reaction
- Connective tissue disease: Arthritis, Vasculitis
- Hyperthyroidism
- Heat Stroke
- Meningitis
- Hypoglycemia/hypothermia
- MI / CVA





# Suspected Sepsis



## Pearls:

- **Recommended Exam: Mental Status, Skin, HEENT, Neck, Heart, Lungs, Abdomen, Back, Extremities, Neuro**
- Early recognition of Sepsis allows for attentive care and early administration of antibiotics.
- Approved destination facilities for severe sepsis: **UNC-Chapel Hill and Duke Medical Center.**
- Aggressive IV fluid therapy is the most important prehospital treatment for sepsis. Suspected septic patients should receive repeated fluid boluses (to a max total of 2 liters) while being checked frequently for signs of pulmonary edema, especially patients with known history of CHF or ESRD on dialysis. STOP fluid infusion in the setting of pulmonary edema.
- Septic patients are especially susceptible to traumatic lung injury and ARDS. If artificial ventilation is necessary, avoid ventilating with excessive tidal volumes. If **CPAP is utilized, airway pressure should be limited to 5 cmH2O.**
- Attempt to identify source of infection (skin, respiratory, etc.) and relay previous treatments and related history to ED physician or nursing staff.
- Elevated serum lactate levels are a useful marker of hypoperfusion in sepsis and often become elevated prior to the onset of hypotension. End Tidal CO2 levels are correlated with lactate levels, trend and monitor EtCO2
- Disseminated Intravascular Coagulation (DIC) is an ominous, late stage manifestation of sepsis characterized by frank, extensive bruising, bleeding from multiple sites and finally tissue death.

## Disposition:

**EMS Transport:**

**ALS:** All patients



# Syncope



## History

- Cardiac history, stroke, seizure
- Occult blood loss (GI, ectopic)
- Females: LMP, vaginal bleeding
- Fluid loss: nausea, vomiting, diarrhea
- Past medical history
- Medications

## Signs and Symptoms

- Loss of consciousness with recovery
- Lightheadedness, dizziness
- Palpitations, slow or rapid pulse
- Pulse irregularity
- Decreased blood pressure

## Differential



- Vasovagal
- Orthostatic hypotension
- Cardiac syncope
- Micturition / Defecation syncope
- Psychiatric
- Stroke
- Hypoglycemia
- Seizure
- Shock (see Shock Protocol)
- Toxicological (Alcohol)
- Medication effect (hypertension)
- PE
- AAA

Age Appropriate Airway Protocol(s) AR 1, 2, 3, 5, 6 <i>if indicated</i>	
	Blood Glucose Analysis Procedure
<b>B</b>	12 Lead ECG Procedure
<b>I</b>	IV / IO Procedure
<b>P</b>	Cardiac Monitor
Altered Mental Status Protocol UP 4 <i>if indicated</i>	
Age Appropriate Cardiac Protocol(s) <i>if indicated</i>	
Age Appropriate Hypotension / Shock Protocol AM 5 / PM 3 <i>if indicated</i>	
Multiple Trauma Protocol TB 6 Spinal Motion Restriction Procedure / Protocol TB 8 <i>if indicated</i>	

Serious Signs / Symptoms  
Hypotension, poor  
perfusion, shock

YES →

NO

 **Notify Destination or  
Contact Medical Control** 

<b>A</b>	IV / IO Procedure Consider 2 Large Bore sites
	<b>Normal Saline 500 mL Bolus</b> Repeat as needed Titrate SPB ≥ 90 mmHg <b>Maximum 2 L</b> <b>Peds: 20 mL/kg IV / IO</b> Repeat as needed Titrate to Age Appropriate SBP ≥ 70 + 2 x Age <b>Maximum 60 mL/kg</b>

Exit to  
Age Appropriate  
Condition Appropriate  
Protocol(s)

Universal Protocol Section





# Syncope



## Pearls

- **Recommended Exam: Mental Status, Skin, HEENT, Heart, Lungs, Abdomen, Back, Extremities, Neuro**
- **Syncope is both loss of consciousness and loss of postural tone. Symptoms preceding the event are important in determining etiology.**
- **Syncope often is due to a benign process but can be an indication of serious underlying disease in both the adult and pediatric patient.**
- **Often patients with syncope are found normal on EMS evaluation. In general patients experiencing syncope require cardiac monitoring and emergency department evaluation.**
- **Differential should remain wide and include:**

<b>Cardiac arrhythmia</b>	<b>Neurological problem</b>	<b>Choking</b>	<b>Pulmonary embolism</b>
<b>Hemorrhage</b>	<b>Stroke</b>	<b>Respiratory</b>	<b>Hypo or Hyperglycemia</b>
<b>GI Hemorrhage</b>	<b>Seizure</b>	<b>Sepsis</b>	
- **High-risk patients:**

<b>Age <math>\geq 60</math></b>	<b>Syncope with exertion</b>
<b>History of CHF</b>	<b>Syncope with chest pain</b>
<b>Abnormal ECG</b>	<b>Syncope with dyspnea</b>
- **Age specific blood pressure 0 – 28 days  $> 60$  mmHg, 1 month - 1 year  $> 70$  mmHg, 1 - 10 years  $> 70 + (2 \times \text{age})$  mmHg and 11 years and older  $> 90$  mmHg.**
- **Abdominal / back pain in women of childbearing age should be treated as pregnancy related until proven otherwise.**
- **The diagnosis of abdominal aneurysm should be considered with abdominal pain, with or without back and / or lower extremity pain or diminished pulses, especially in patients over 50 and / or patients with shock/ poor perfusion. Notify receiving facility early with suspected abdominal aneurysm.**
- **Consider cardiac etiology in patients  $> 50$ , diabetics and / or women especially with upper abdominal complaints.**
- **Heart Rate: One of the first clinical signs of dehydration, almost always increased heart rate, tachycardia increases as dehydration becomes more severe, very unlikely to be significantly dehydrated if heart rate is close to normal.**
- **Syncope with no preceding symptoms or event may be associated with arrhythmia.**
- **Assess for signs and symptoms of trauma if associated or questionable fall with syncope.**
- **Consider dysrhythmias, GI bleed, ectopic pregnancy, and seizure as possible causes of syncope.**
- **These patients should be transported. Patients who experience syncope associated with headache, neck pain, chest pain, abdominal pain, back pain, dyspnea, or dyspnea on exertion need prompt medical evaluation.**
- **More than 25% of geriatric syncope is cardiac dysrhythmia based.**

## Disposition:

**EMS Transport:**

**ALS:** All patients



# Fall Risk Assessment



## History

- Social Support
- History of Fall?
- Recent Hospitalization
- Polypharmacy?
- Past medical history

## Rule in Criteria

- Age  $\geq 60$ ?
- Age  $\geq 45$  with serious health condition or movement disorder
- Provider suspects fall risk
- Provider has responded to fall
- Any lifting assistance response

## Differential

- CVA
- ACS
- Arrhythmia
- Hypo/Hyperglycemia
- Trauma
- Dehydration
- Overdose
- Asthma
- Incontinence

### EMS Suspects Fall Risk

EMS Conducts Falls Screening Tool

Provider asks the following questions:

1. Have you fallen in the past year?
2. Are you worried that you will fall?
3. Do you feel unsteady when standing or walking?

NO

Provide patient falls education material and OC Department on Aging magnet

Provider completes appropriate Zoll ePCR Fall Risk fields

Yes to any 1 or more of the questions above

Provide patient falls education material and OC Department on Aging magnet

Provider completes appropriate Zoll ePCR Fall Risk fields

Inform patient of OCES follow up

OCES makes follow-up 72 hours post initial patient contact (may repeat up to three times)

## Disposition:

**EMS Transport:** Per complaint specific protocol

Universal Protocol Section



# Inebriated Person



## History:

- Medical History
- Quantity / Duration of ETOH use
- Medications (Rx or recreational)

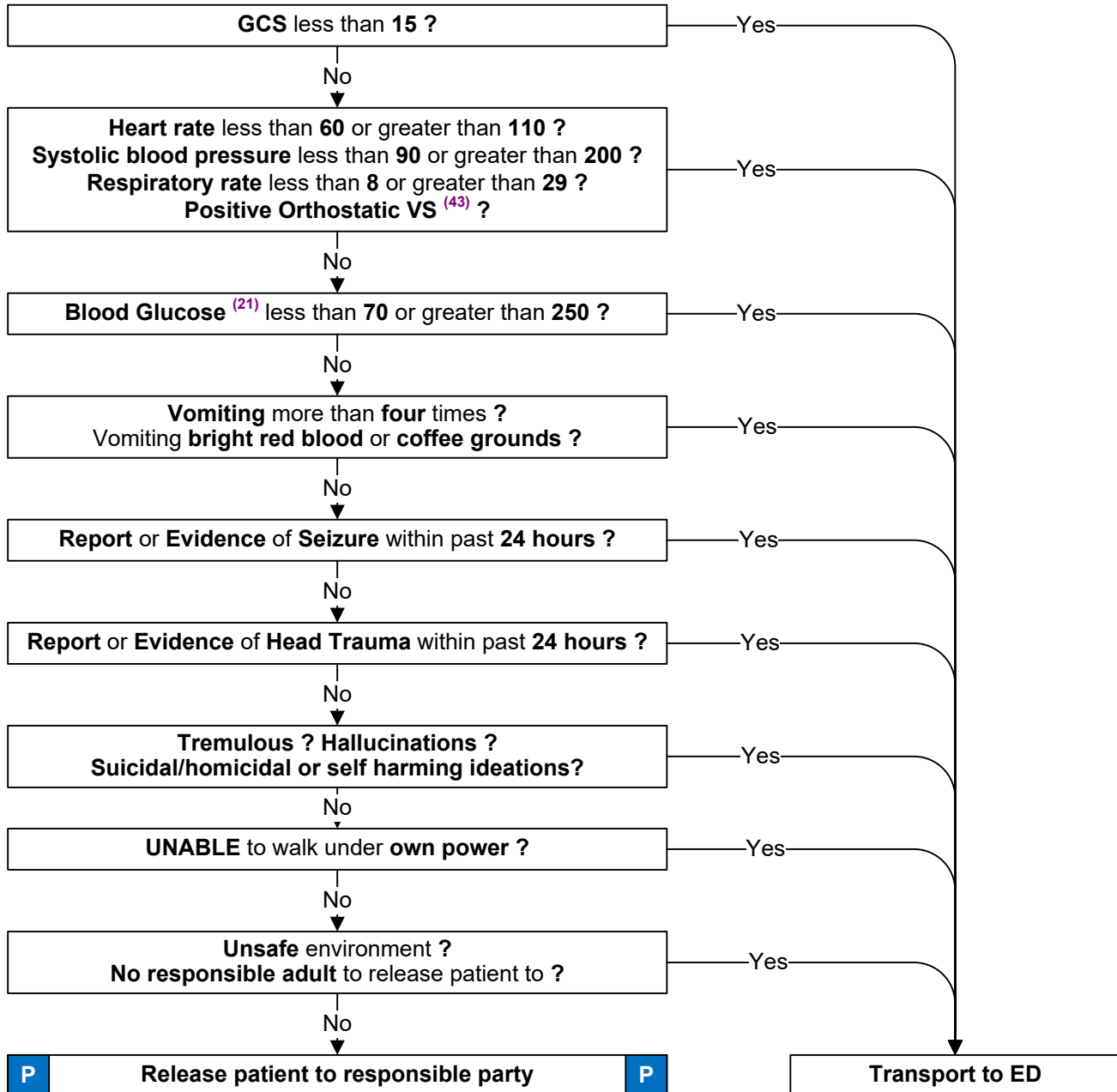
## Signs and Symptoms:

- Level of consciousness
- Vomiting
- Staggered gait
- Slurred speech
- Blurred vision

## Differential:

- Diabetic
- Psychiatric
- Overdose
- Any differential from Altered Mental Status protocol (25)

Universal Protocol Section



## Pearls:

- **Exam: Mental Status, Neuro, Vital Signs**
- Serious medical conditions can present as inebriation. It is the paramedic's responsibility to rule out other causes.
- Unsafe environment means a place where physical injury (trauma or hypo/hyperthermia) is probable.

## Disposition:

**EMS Transport:**

**ALS:** Abnormal VS, GCS, glucose, possible hemorrhage, possible seizure

**BLS:** Other patients not released to responsible party



# Mobile Crisis Mental Health Protocol



## History

- Situational Crisis
- Threats of hurting self
- Known psychiatric disease
- Severe anxiety / panic attacks
- Worsening depression

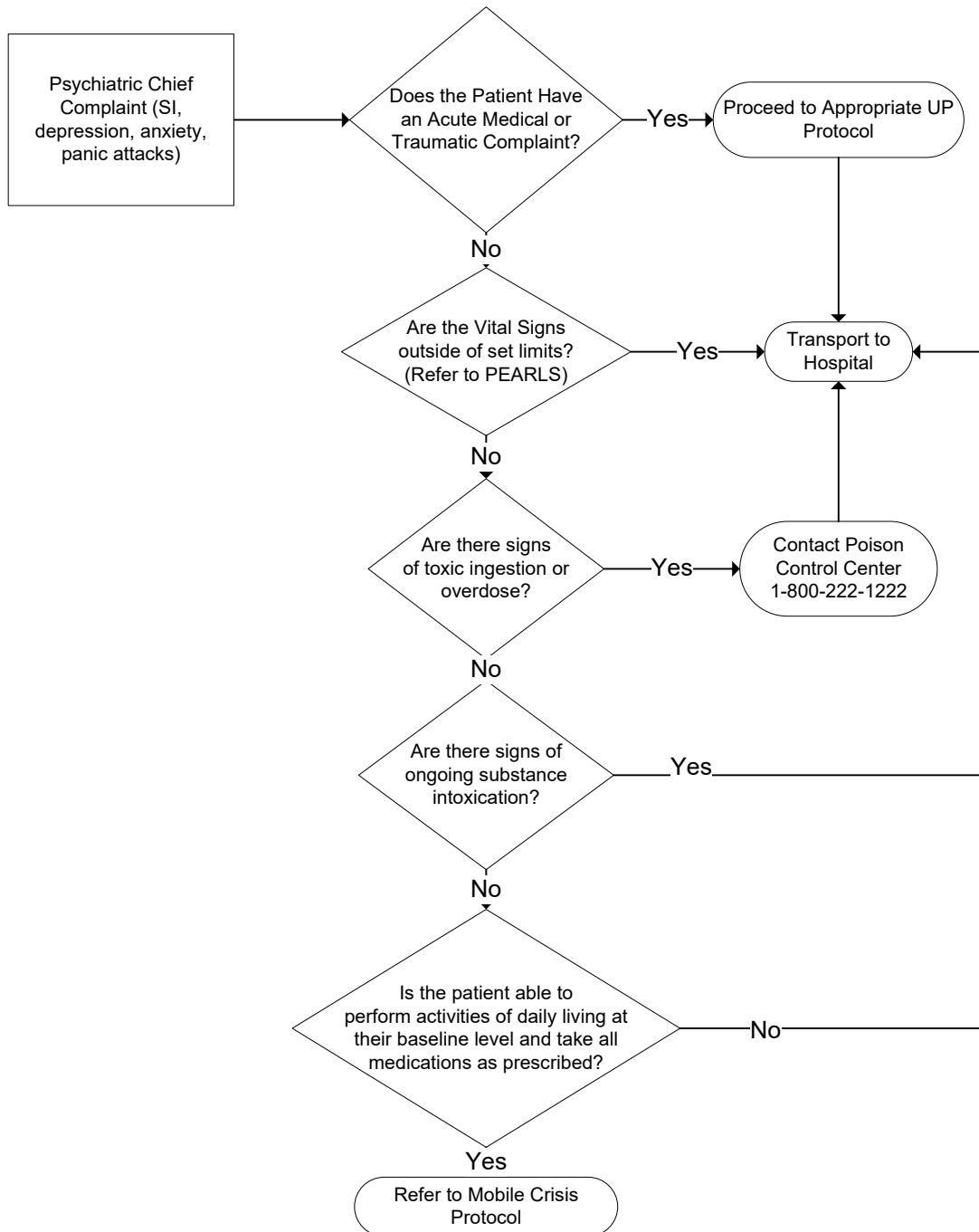
## Signs and Symptoms

- Suicidal thoughts
- Anxiety or agitation
- Depression

## Differential

- Altered mental status
- Excited delirium
- Intoxication
- Overdose
- Endocrine abnormality

## Medical Clearance Evaluation

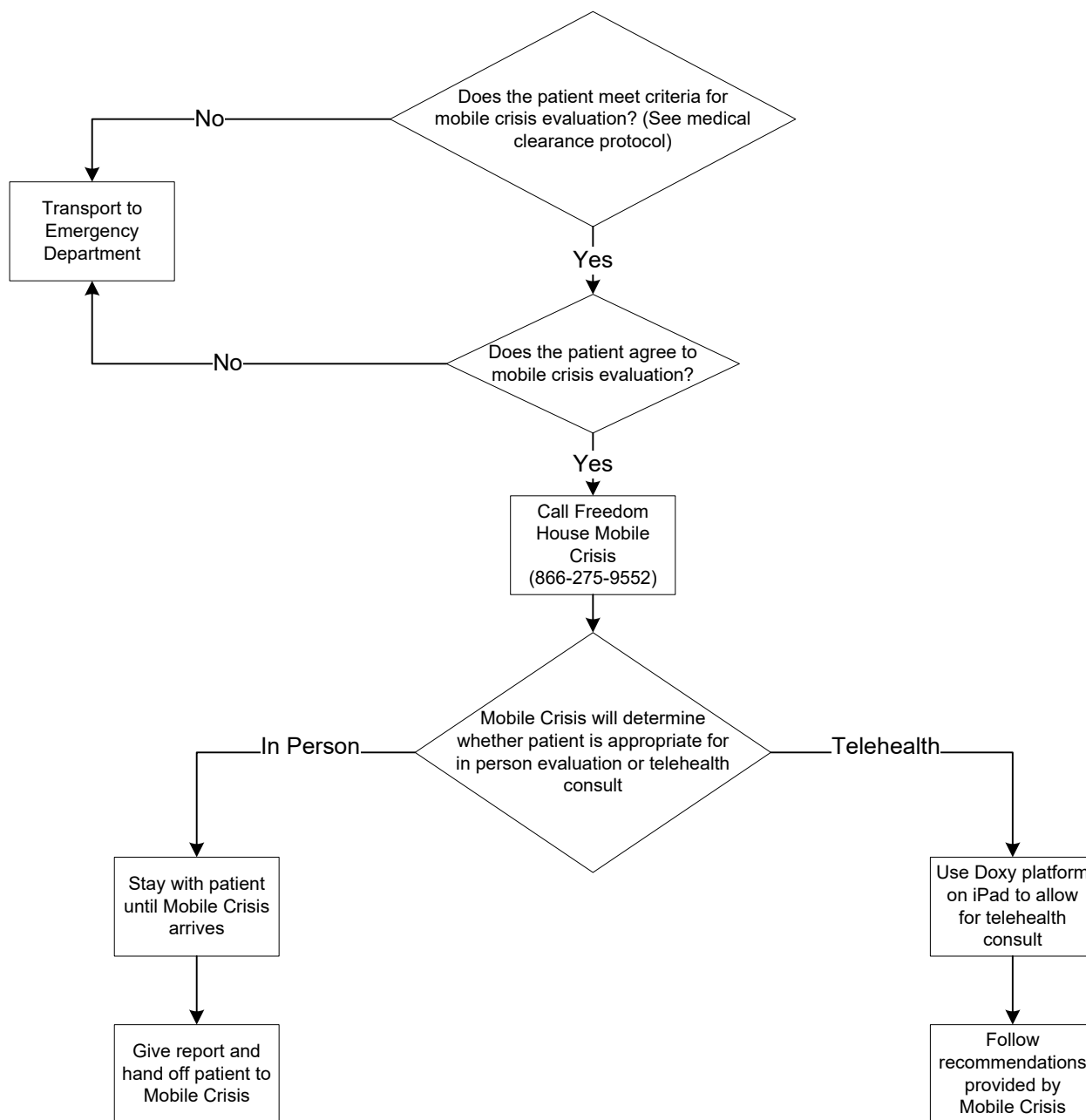




# Medical Clearance for Mental Health Protocol



## Mobile Crisis Evaluation Protocol for Mental Health Patients





## PEARLS

### Appropriate Patient Population

**Past Medical History:** Patients must have a known history of psychiatric illness, current situational crisis or recent increase in life stressors.

**Presentation:** Appropriate chief complaints include depression, anxiety, suicidal ideation or panic attacks

### Acute medical or traumatic conditions

**Medical Complaints:** Patients with ongoing medical complaints require transport to the Emergency Department

**Ongoing bleeding/wounds:** Patients with on-going bleeding or wounds requiring further treatment should be transported to the Emergency Department.

**Medication administration:** Patients who require medication administration (i.e. Narcan, Haldol, Benadryl, etc) must be transported to the Emergency Department for evaluation.

**Aggressive/Violent patients:** Any patient who is aggressive, violent or expresses homicidal ideation requires transport to the Emergency Department.

**Psychotic Patients:** Any patients displaying evidence of psychosis (ex: reports of auditory or visual hallucinations, responding to external stimuli) must be transported to the Emergency Department

**Minor Patients:** If the patient is a minor and the parent or guardian agrees to mobile crisis evaluation, the parent/guardian must remain with the patient through the evaluation and accompany them to the Emergency Department if an IVC is required.

**Minor Injuries:** Patient with minor injuries must be evaluated prior to contacting mobile crisis. Minor wounds that do not require ongoing medical care are appropriate for mobile crisis evaluation.

### Appropriate Vital Sign Ranges

**Heart Rate:** Greater than 60 and less than 120

**Respiratory Rate and Pulse Oximetry:** RR<24, SpO<sub>2</sub>>92%

**Blood Pressure:** Systolic blood pressure > 100 and BP < 200/100.

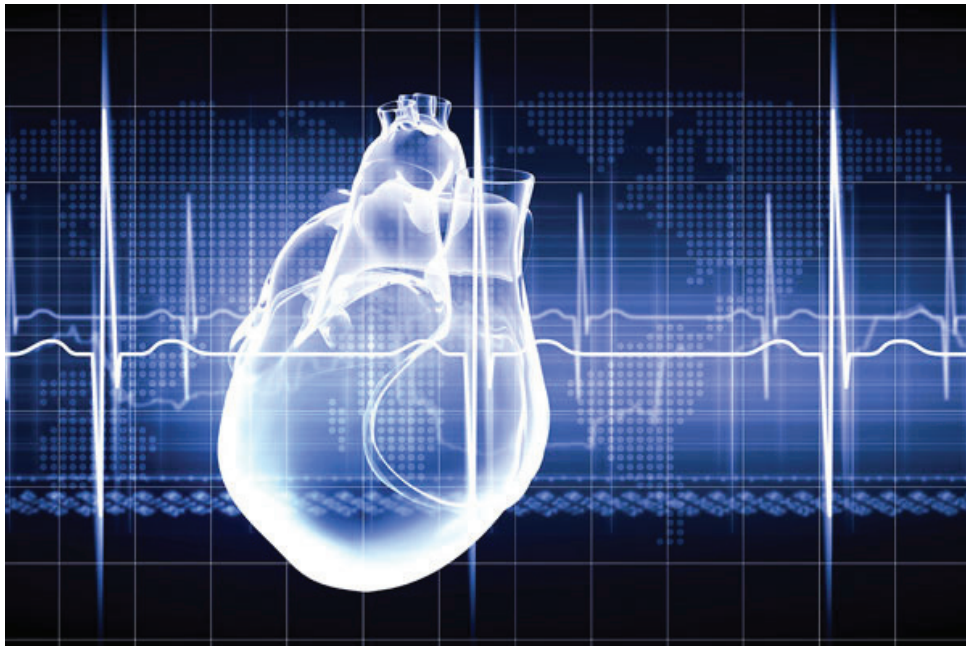
**Blood Glucose:** >70 mg/dL and <250 mg/dL

**Temperature:** >96.8 F and < 100.4 F

**Age:** 13 years and older

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# Adult Cardiac







# Adult Asystole / Pulseless Electrical Activity



## History

- SAMPLE
- Estimated downtime
- See Reversible Causes below
- DNR, MOST, or Living Will

## Signs and Symptoms

- Pulseless
- Apneic
- No electrical activity on ECG
- No heart tones on auscultation

## Differential

- See Reversible Causes below



Cardiac Arrest Protocol AC 3

Criteria for Death / No Resuscitation  
Review DNR / MOST Form

YES

Decomposition  
Rigor mortis  
Dependent lividity  
Blunt force trauma  
Injury incompatible with life  
Extended downtime with asystole

Do not begin resuscitation

Follow Deceased Subjects Policy

NO

**Begin Continuous CPR Compressions**  
**Push Hard ( $\geq 2$  inches)**  
**Push Fast (110 - 120 / min)**  
**Change Compressors every 2 minutes**  
**(sooner if fatigued)**  
**(Limit changes / pulse checks  $\leq 10$  seconds)**

**Ventilate 1 breath every 6 seconds**  
**30:2 Compression:Ventilation if no Advanced Airway**  
**Monitor EtCO<sub>2</sub> if available**

AED Procedure  
**if available**

Search for Reversible Causes

Consider Chest Decompression Procedure

Cardiac Monitor

IV / IO Procedure

**Epinephrine (1:10,000) 1 mg IV / IO**  
Repeat every 3 to 5 minutes

**Normal Saline Bolus 500 mL IV / IO**  
May repeat as needed  
**Maximum 2 L**



Adult Rhythm Appropriate Protocol(s)  
**as indicated**



On Scene Resuscitation / Termination of Resuscitation  
Protocol(s) AC 12  
**as indicated**

**AT ANY TIME**

Return of  
Spontaneous  
Circulation



Go to  
Post Resuscitation  
Protocol AC 9

## Reversible Causes

Hypovolemia  
Hypoxia  
Hydrogen ion (acidosis)  
Hypothermia  
Hypo / Hyperkalemia

Tension pneumothorax  
Tamponade; cardiac  
Toxins  
Thrombosis; pulmonary (PE)  
Thrombosis; coronary (MI)



Notify Destination or  
Contact Medical Control



Adult Cardiac Protocol Section

AC 1



# Adult Asystole / Pulseless Electrical Activity



## Pearls

- **Team Focused Approach / Pit-Crew Approach recommended; assigning responders to predetermined tasks. Refer to optional protocol or development of local agency protocol.**
- **Efforts should be directed at high quality and continuous compressions with limited interruptions and early defibrillation when indicated.**
- **DO NOT HYPERVENTILATE:** If no advanced airway (BIAD, ETT), compression to ventilation ratio is 30:2. If advanced airway in place, ventilate 10 breaths per minute with continuous, uninterrupted compressions.
- **Do not interrupt compressions to place endotracheal tube. Consider BIAD first to limit interruptions.**
- **Passive oxygenation optional in agencies practicing Team Focused Approach / Pit-Crew Approach.**
- Reassess and document BIAD and / or endotracheal tube placement and EtCO<sub>2</sub> frequently, after every move, and at transfer of care.
- **IV / IO access and drug delivery is secondary to high-quality chest compressions and early defibrillation.**
- **Defibrillation:** Follow manufacture's recommendations concerning defibrillation / cardioversion energy when specified.
- **End Tidal CO<sub>2</sub> (EtCO<sub>2</sub>)**
  - If EtCO<sub>2</sub> is < 10 mmHg, improve chest compressions.
  - If EtCO<sub>2</sub> spikes, typically > 40 mmHg, consider Return of Spontaneous Circulation (ROSC)
- **Special Considerations**
  - Maternal Arrest** - Treat mother per appropriate protocol with immediate notification to Medical Control and rapid transport preferably to obstetrical center if available and proximate. Place mother supine and perform Manual Left Uterine Displacement moving uterus to the patient's left side. IV/IO access preferably above diaphragm. Defibrillation is safe at all energy levels.
  - Renal Dialysis / Renal Failure** - Refer to Dialysis / Renal Failure protocol caveats when faced with dialysis / renal failure patient experiencing cardiac arrest. 1 g Calcium Chloride given to all of these patients.
  - Opioid Overdose** - Naloxone cannot be recommended in opioid-associated cardiac arrest. If suspected, attention to airway, oxygenation, and ventilation increase in importance. Naloxone is not associated with improved outcomes in cardiac arrest.
  - Drowning / Suffocation / Asphyxiation / Hanging / Lightning Strike** – Hypoxic associated cardiac arrest and prompt attention to airway and ventilation is priority followed by high-quality and continuous chest compressions and early defibrillation.
- **Transcutaneous Pacing:**
  - Pacing is NOT effective in cardiac arrest and pacing in cardiac arrest does NOT increase chance of survival
- Success is based on proper planning and execution. Procedures require space and patient access. Make room to work.
- Discussion with Medical Control can be a valuable tool in developing a differential diagnosis and identifying possible treatment options.

## Disposition:

**EMS Transport:**      **ALS:**      Any perfusing rhythm or unusual circumstance which does not meet the Criteria for Death, Discontinuation of Resuscitation, or Do Not Resuscitate Policies.



# Bradycardia; Pulse Present



## History

- Past medical history
- Medications
  - Beta-Blockers
  - Calcium channel blockers
  - Clonidine
  - Digoxin
- Pacemaker

## Signs and Symptoms

- HR < 60/min with hypotension, acute altered mental status, chest pain, acute CHF, seizures, syncope, or shock secondary to bradycardia
- Chest pain
- Respiratory distress
- Hypotension or Shock
- Altered mental status
- Syncope

## Differential

- Acute myocardial infarction
- Hypoxia / Hypothermia
- Pacemaker failure
- Sinus bradycardia
- Head injury (elevated ICP) or Stroke
- Spinal cord lesion
- Sick sinus syndrome
- AV blocks (1°, 2°, or 3°)
- Overdose

Exit to  
Appropriate  
Protocol(s)



**Heart Rate < 60 / min with signs of Shock**

(SBP < 90, EtCO2 < 26mmHg, significant AMS)

YES

	Airway Protocol(s) AR 1, 2, 3 <i>if indicated</i>
	Respiratory Distress Protocol AR 4 <i>if indicated</i>
	Chest Pain: Cardiac and STEMI Protocol AC 4 <i>if indicated</i>
B	Search for Reversible Causes
	12 Lead ECG Procedure
A	IV / IO Procedure
P	Cardiac Monitor
A	<b>Normal Saline Fluid Bolus</b> <b>500 mL – 2 L NS IV / IO</b> (Unless Acute CHF) <b>Maximum 2 L</b>
	<b>Atropine 0.5 mg IV / IO</b> May repeat every 3 – 5 minutes <b>Maximum 3 mg</b>
	<b>Epinephrine 1 - 10 mcg/min IV / IO</b> Titrate to SBP ≥ 90 mmHg
P	<b>Norepinephrine 1-10 mcg/min IV/IO</b> Or <b>Dopamine 2 – 20 mcg/kg/min IV / IO</b> Titrate to SBP ≥ 90 mmHg Maintain MAP > 65mmHg
	<b>If No Improvement</b> <b>Transcutaneous Pacing Procedure</b> (Consider earlier in 2 <sup>nd</sup> or 3 <sup>rd</sup> AVB)
	<b>Notify Destination or</b> <b>Contact Medical Control</b>

## Reversible Causes

Hypovolemia  
Hypoxia  
Hydrogen ion (acidosis)  
Hypothermia  
Hypo / Hyperkalemia  
  
Tension pneumothorax  
Tamponade; cardiac  
Toxins  
Thrombosis; pulmonary (PE)  
Thrombosis; coronary (MI)

## Consider Sedation

**Midazolam 2 – 2.5 mg**  
**IV / IO / IM / IN**  
If SBP > 110  
**Maximum 10 mg**

OR

**Fentanyl 25 mcg**  
**IV/IO/IM/IN**  
If SBP > 90

Adult Cardiac Protocol Section



# Bradycardia; Pulse Present



## Pearls

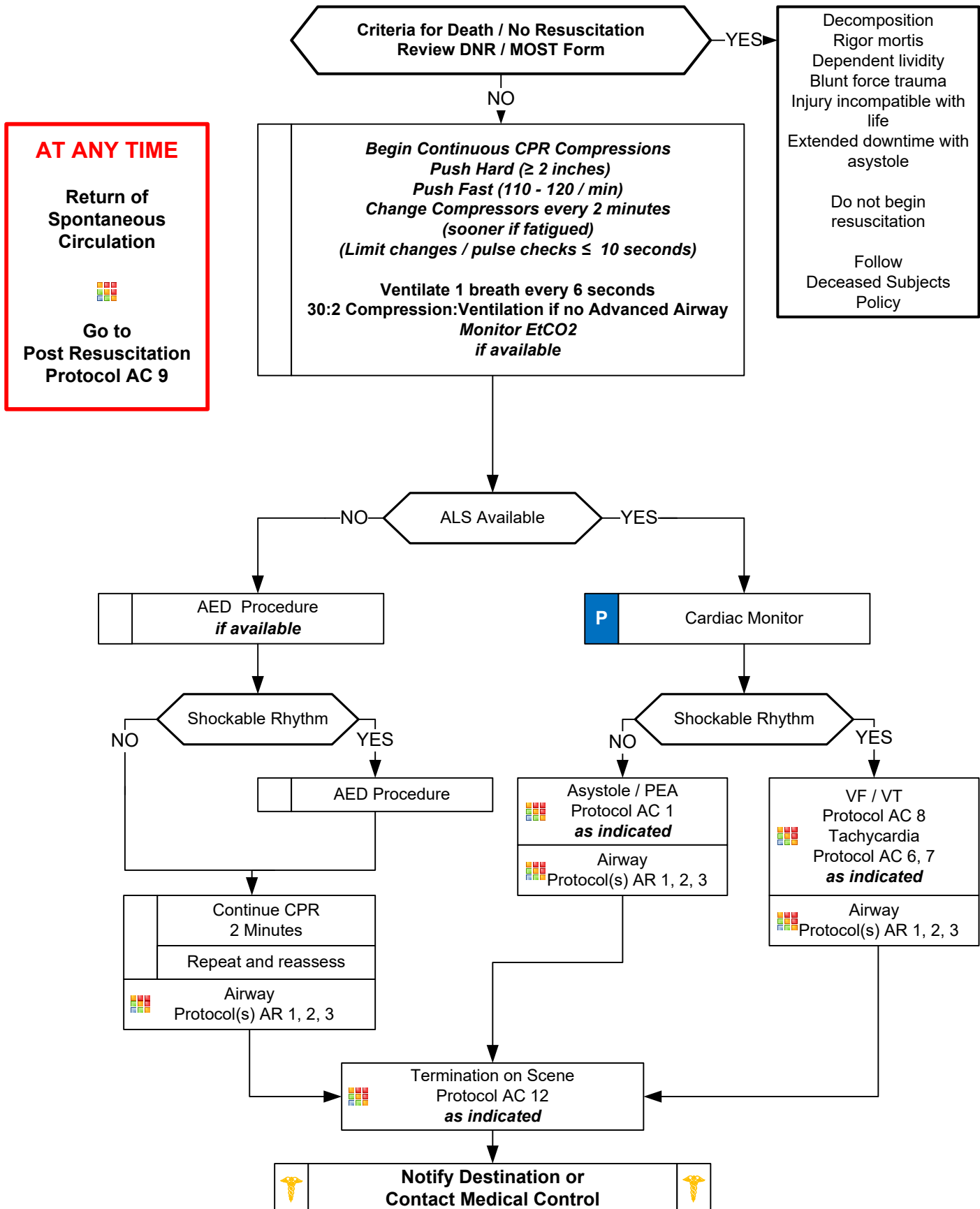
- **Recommended Exam: Mental Status, Neck, Heart, Lungs, Neuro**
- **Identifying signs and symptoms of poor perfusion caused by bradycardia are paramount.**
- **Rhythm should be interpreted in the context of symptoms and pharmacological treatment given only when symptomatic, otherwise monitor and reassess.**
- **Consider hyperkalemia with wide complex, bizarre appearance of QRS complex, and bradycardia.**
- Hypoxemia is a common cause of bradycardia. Ensure oxygenation and support respiratory effort.
- **Atropine**
  - Do NOT delay Transcutaneous Pacing to administer Atropine in bradycardia with poor perfusion. Caution in setting of acute MI. Elevated heart rate can worsen ischemia.
  - Ineffective and potentially harmful in cardiac transplantation. May cause paradoxical bradycardia.
- **Transcutaneous Pacing Procedure (TCP)**
  - Utilize TCP early if no response to atropine. If time allows transport to specialty center because transcutaneous pacing is a temporizing measure. Transvenous / permanent pacemaker will probably be needed.
  - Immediate TCP with high-degree AV block (2d or 3d degree) with no IV / IO access.
- Consider treatable causes for bradycardia (Beta Blocker OD, Calcium Channel Blocker OD, Hyperkalemia, etc.)

## Disposition:

**EMS Transport:**                    **ALS:** Any patient other than listed below  
   **BLS:** Asymptomatic with unrelated complaint and HR  $\geq$  45  
**MD Within 24 Hours:** Asymptomatic with unrelated complaint and HR  $\geq$  45



# Cardiac Arrest; Adult





# Cardiac Arrest; Adult



## Pearls

- **Team Focused Approach / Pit-Crew Approach recommended; assign responders to predetermined tasks. Refer to optional protocol or development of local agency protocol.**
- **Efforts should be directed at high quality and continuous compressions with limited interruptions and early defibrillation when indicated.**
- **DO NOT HYPERVENTILATE:** If no advanced airway (BIAD, ETT) compression to ventilation ratio is 30:2. If advanced airway in place, ventilate 10 breaths per minute with continuous, uninterrupted compressions.
- **Do not interrupt compressions to place endotracheal tube. Consider BIAD first to limit interruptions.**
- **Passive oxygenation optional in agencies practicing Team Focused Approach / Pit-Crew Approach.**
- Reassess and document BIAD and / or endotracheal tube placement and EtCO<sub>2</sub> frequently, after every move, and at transfer of care.
- **IV / IO access and drug delivery is secondary to high-quality chest compressions and early defibrillation.**
- **Defibrillation:** Follow manufacture's recommendations concerning defibrillation / cardioversion energy when specified.
- **End Tidal CO<sub>2</sub> (EtCO<sub>2</sub>)**
  - If EtCO<sub>2</sub> is < 10 mmHg, improve chest compressions.
  - If EtCO<sub>2</sub> spikes, typically > 40 mmHg, consider Return of Spontaneous Circulation (ROSC)
- **Special Considerations**
  - Maternal Arrest** - Treat mother per appropriate protocol with immediate notification to Medical Control and rapid transport preferably to obstetrical center if available and proximate. Place mother supine and perform Manual Left Uterine Displacement moving uterus to the patient's left side. IV/IO access preferably above diaphragm. Defibrillation is safe at all energy levels.
  - Renal Dialysis / Renal Failure** - Refer to Dialysis / Renal Failure protocol caveats when faced with dialysis / renal failure patient experiencing cardiac arrest.
  - Opioid Overdose** - Naloxone cannot be recommended in opioid-associated cardiac arrest. If suspected, attention to airway, oxygenation, and ventilation increase in importance. Naloxone is not associated with improved outcomes in cardiac arrest.
  - Drowning / Suffocation / Asphyxiation / Hanging / Lightning Strike** – Hypoxic associated cardiac arrest and prompt attention to airway and ventilation is priority followed by high-quality and continuous chest compressions and early defibrillation.
- **Transcutaneous Pacing:**
  - Pacing is NOT effective in cardiac arrest and pacing in cardiac arrest does NOT increase chance of survival
- Success is based on proper planning and execution. Procedures require space and patient access. Make room to work.
- Discussion with Medical Control can be a valuable tool in developing a differential diagnosis and identifying possible treatment options.



# Cardiac Arrest; Adult



Today's Date:

Patient Name:

Patient DOB:

## **PRE-ROSC Adult Cardiac Arrest Checklist**

- ☐ Code Commander is identified
- ☐ Scene Manager ensures adequate space for resuscitation
- ☐ Continuous compressions are ongoing at 110-120 beats per minute, using a metronome when possible
- ☐ Change compressors every 2 minutes; limit changes/pulse checks to less than 10 seconds
- ☐ Monitor is visible and the code commander is viewing the rhythm with all appropriate leads attached
- ☐ Defibrillations occurring at 2 minute intervals for shockable rhythms
- ☐ Airway managed with either a King airway, OPA with BVM, or an ETT
- ☐ O2 cylinder with adequate PSI is attached to BVM
- ☐ ETCO2 waveform is present when an advanced airway is present, and the value is being monitored
- ☐ Blinking light ventilatory reminder is in place
- ☐ Vascular access has been obtained (IV/IO)
- ☐ Epinephrine (1:10,000) 1mg IV/IO is given every 3-5 minutes
- ☐ TrueCPR applied if possible or appropriate
- ☐ Underlying causes have been considered and treated early in arrest
  - o H's: Hydrogen ions (acidosis), hyperkalemia/hypokalemia, hypoxia, hypovolemia, hypothermia
  - o T's: Toxins, Tamponade, tension pneumothorax, thrombosis, thromboembolism
- ☐ Gastric distension is not a factor; if a factor correct as appropriate while monitoring ETCO2
- ☐ Family is receiving care and is at the patient's side if appropriate

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# Chest Pain: Cardiac and STEMI



## History

- Age
- Medications (Viagra / sildenafil, Levitra / vardenafil, Cialis / tadalafil)
- Past medical history (MI, Angina, Diabetes, post menopausal)
- Allergies
- Recent physical exertion
- Palliation / Provocation
- Quality (crampy, constant, sharp, dull, etc.)
- Region / Radiation / Referred
- Severity (1-10)
- Time (onset / duration / repetition)

## Signs and Symptoms

- CP (pain, pressure, aching, vice-like tightness)
- Location (substernal, epigastric, arm, jaw, neck, shoulder)
- Radiation of pain
- Pale, diaphoresis
- Shortness of breath
- Nausea, vomiting, dizziness
- **Time of Onset**
- Women:
  - More likely to have dyspnea, N/V, weakness, back or jaw pain

## Differential

- Trauma vs. Medical
- Angina vs. Myocardial infarction
- Pericarditis
- Pulmonary embolism
- Asthma / COPD
- Pneumothorax
- Aortic dissection or aneurysm
- GE reflux or Hiatal hernia
- Esophageal spasm
- Chest wall injury or pain
- Pleural pain
- Overdose: Cocaine or Methamphetamine

	<b>12 Lead ECG Procedure</b>
<b>B</b>	<b>Aspirin 81 mg x 4 PO (chewed) Or 325 mg PO</b>
	<b>Nitroglycerin 0.3 / 0.4 mg Sublingual</b> Repeat every 5 minutes x 3 <i>if prescribed to patient and (BP ≥ 100)</i>
<b>P</b>	Cardiac Monitor

**Acute MI / STEMI**  
(STEMI = 1 mm ST Segment Elevation ≥ 2 Contiguous Leads)

NO

<b>A</b>	IV / IO Procedure
<b>A</b>	<b>Nitroglycerin 0.3 / 0.4 mg SL</b> Repeat every 5 minutes as needed
<b>P</b>	<b>Morphine 2 – 4 mg IV / IO</b> Repeat every 5 minutes as needed <b>Maximum 10 mg</b> Or <b>Fentanyl 50 mcg (0.25-1 mcg/kg)</b> IM/IV/IO/IN 25-50 mcg may be repeated in 5 mins <b>Maximum 200 mcg</b>
	Hypotension / Shock Protocol AM 5 <i>if indicated</i>
	CHF / Pulmonary Edema Protocol AC 5 <i>if indicated</i>

## Transport based on:

### STEMI

**EMS Triage and Destination Plan**  
**Immediate Notification of Facility**  
**Immediate Transmission of ECG**  
*if capable*  
**Keep Scene Time to ≤ 10 Minutes**

**B**

*If transporting to Non PCI Center*  
**Reperfusion Checklist**



**Notify Destination or  
Contact Medical Control**



Adult Cardiac Protocol Section



# Chest Pain: Cardiac and STEMI



I Lateral	aVR	V1 Septal	V4 Anterior
II Inferior	aVL Lateral	V2 Septal	V5 Lateral
III Inferior	aVF Inferior	V3 Anterior	V6 Lateral
SITE	FACING	RECIPROCAL	
SEPTAL	V1, V2	NONE	
ANTERIOR	V3, V4	NONE	
ANTEROSEPTAL	V1, V2, V3, V4	NONE	
LATERAL	I, aVL, V5, V6	II, III, aVF	
ANTEROLATERAL	I, aVL, V3, V4, V5, V6	II, III, aVF	
INFERIOR	II, III, aVF	I, aVL	
POSTERIOR	NONE	V1, V2, V3, V4	

## Pearls

- **Recommended Exam: Mental Status, Skin, Neck, Lung, Heart, Abdomen, Back, Extremities, Neuro**
- **Items in Red Text are the key performance indicators for the EMS Acute Cardiac (STEMI) Care Toolkit**
- Avoid Nitroglycerin in any patient who has used Viagra (sildenafil) or Levitra (vardenafil) in the past 24 hours or Cialis (tadalafil) in the past 36 hours due to potential severe hypotension.
- **STEMI (ST-Elevation Myocardial Infarction)**
  - Positive Reperfusion Checklist should be transported to the appropriate facility based on STEMI EMS Triage and Destination Plan.
  - Consider placing 2 IV sites in the left arm: Many PTCI centers use the right radial vein for intervention.
  - Consider placing defibrillator pads on patient as a precaution.
  - Consider Normal Saline or Lactated Ringers bolus of 250 – 500 mL as pre-cath hydration.
- If CHF / Cardiogenic shock resulting from inferior MI (II, III, aVF), consider Right Sided ECG (V3 or V4). If ST elevation noted Nitroglycerin and / or opioids may cause hypotension requiring normal saline boluses.
- Titrate oxygen administration for an SpO2 between 94 – 99%
- If patient has taken nitroglycerin without relief, consider potency of the medication.
- Monitor for hypotension after administration of nitroglycerin and narcotics (Morphine, Fentanyl, or Dilaudid).
- Diabetic, geriatric and female patients often have atypical pain, or only generalized complaints.
- Document the time of the 12-Lead ECG in the PCR as a Procedure along with the interpretation (Paramedic).
- **EMT may administer Nitroglycerin to patients already prescribed medication. May give from EMS supply.**
- Agency medical director may require Contact of Medical Control prior to administration.

## Disposition:

EMS Transport: ALS: All patients



# CHF / Pulmonary Edema



## History

- Congestive heart failure
- Past medical history
- Medications (digoxin, Lasix, Viagra / sildenafil, Levitra / vardenafil, Cialis / tadalafil)
- Cardiac history --past myocardial infarction

## Signs and Symptoms

- Respiratory distress, bilateral rales
- Apprehension, orthopnea
- Jugular vein distention
- Pink, frothy sputum
- Peripheral edema, diaphoresis
- Hypotension, shock
- Chest pain

## Differential

- Myocardial infarction
- Congestive heart failure
- Asthma
- Anaphylaxis
- Aspiration
- COPD
- Pleural effusion
- Pneumonia
- Pulmonary embolus
- Pericardial tamponade
- Toxic Exposure

Airway Protocol(s) AR 1, 2, 3 <i>as indicated</i>	
Chest Pain and STEMI Protocol AC 4 <i>if indicated</i>	
B	12 Lead ECG Procedure
	<b>Nitroglycerin 0.3 / 0.4 mg Sublingual</b> Repeat every 5 minutes x 3 <i>if prescribed to patient and (BP &gt;100)</i>
P	Cardiac Monitor
A	IV / IO Procedure

Assess Symptom Severity

### MILD

Normal Heart Rate  
Elevated or Normal BP

**Nitroglycerin 0.3 / 0.4 mg SL**  
Repeat every 5 minutes

**Nitroglycerin Paste**  
SBP > 100 1 inch  
SBP > 150 1.5 inches  
SBP > 200 2 inches

Improving

YES

NO

### MODERATE / SEVERE

Elevated Heart Rate  
Elevated BP

#### Airway CPAP Procedure

**Nitroglycerin 0.3 / 0.4 mg SL**  
Repeat every 5 minutes

**Nitroglycerin Paste**  
SBP > 100 1 inch  
SBP > 150 1.5 inches  
SBP > 200 2 inches

### CARDIOGENIC SHOCK

Tachycardia followed by  
bradycardia  
Hypertension followed by  
hypotension

Remove CPAP  
*if in place*

Adult Hypotension / Shock  
Protocol AM 5  
*if indicated*

Notify Destination or  
Contact Medical Control

AC 5

Any local EMS System changes to this document must follow the NC OEMS Protocol Change Policy and be approved by OEMS

Adult Cardiac Protocol Section



# CHF / Pulmonary Edema



## Pearls

- **Recommended Exam: Mental Status, Skin, Neck, Lung, Heart, Abdomen, Back, Extremities, Neuro**
- **Items in Red Text are key performance measures used to evaluate protocol compliance and care**
- **Furosemide and Opioids have NOT been shown to improve the outcomes of EMS patients with pulmonary edema. Even though this historically has been a mainstay of EMS treatment, it is no longer routinely recommended.**
- **Avoid Nitroglycerin in any patient who has used Viagra (sildenafil) or Levitra (vardenafil) in the past 24 hours or Cialis (tadalafil) in the past 36 hours due to potential severe hypotension.**
- **Carefully monitor the level of consciousness, BP, and respiratory status with the above interventions.**
- **If CHF / Cardiogenic shock resulting from inferior MI (II, III, aVF), consider Right Sided ECG (V3 or V4). If ST elevation noted Nitroglycerin and / or opioids may cause hypotension requiring normal saline boluses.**
- If patient has taken nitroglycerin without relief, consider potency of the medication.
- Contraindications to opioids include severe COPD and respiratory distress. Monitor the patient closely.
- Consider myocardial infarction in all these patients. Diabetics, geriatric and female patients often have atypical pain, or only generalized complaints.
- Allow the patient to be in their position of comfort to maximize their breathing effort.
- Document CPAP application using the CPAP procedure in the PCR. Document 12 Lead ECG using the 12 Lead ECG procedure.
- **EMT may administer Nitroglycerin to patients already prescribed medication. May give from EMS supply.**

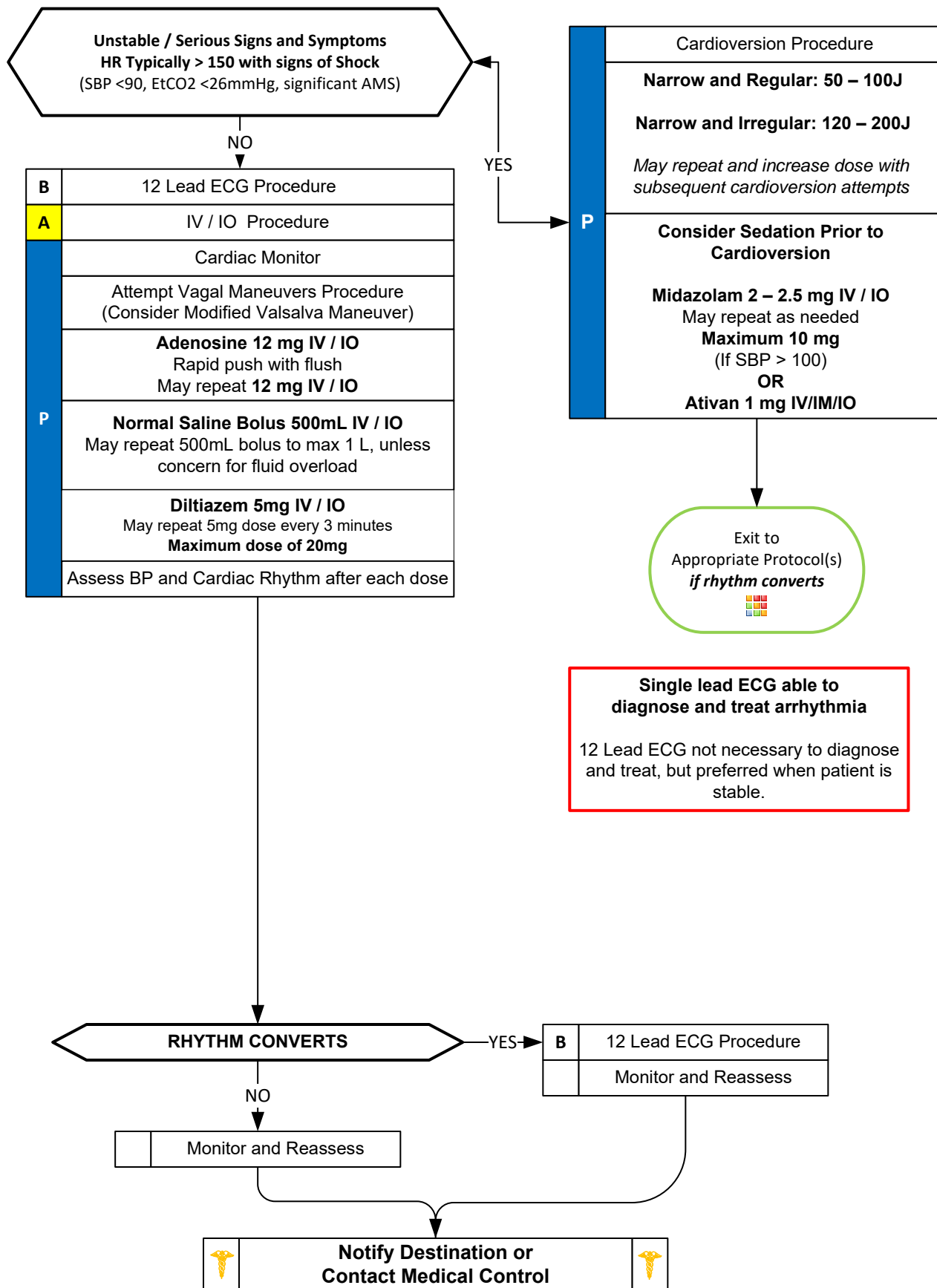
## Disposition:

**EMS Transport:**      **ALS:**   All patients



# Adult Tachycardia

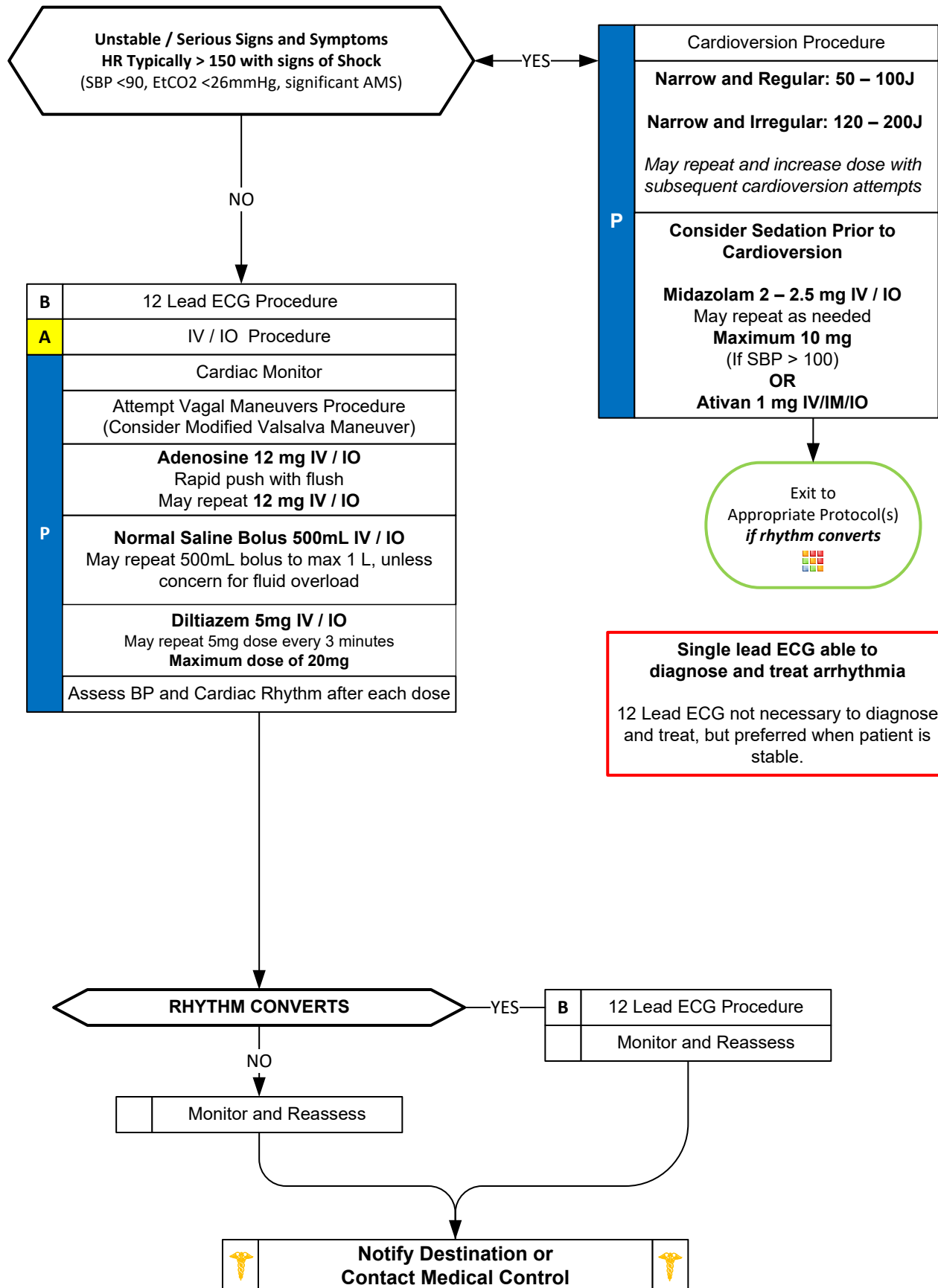
## Narrow Complex ( $\leq 0.11$ sec) REGULAR RHYTHM





# Adult Tachycardia

## Narrow Complex ( $\leq 0.11$ sec) IRREGULAR RHYTHM





# Adult Tachycardia Narrow Complex ( $\leq 0.11$ sec)



## Pearls

- **Recommended Exam: Mental Status, Skin, Neck, Lung, Heart, Abdomen, Back, Extremities, Neuro**
- **Most important goal is to differentiate the type of tachycardia and if STABLE or UNSTABLE and SYMPTOMATIC.**
- **Rhythm should be interpreted in the context of symptoms.**
- **Unstable condition**  
**Condition which acutely impairs vital organ function and cardiac arrest may be imminent.**  
**If at any point patient becomes unstable move to unstable arm in algorithm.**
- **Symptomatic condition**  
Arrhythmia is causing symptoms such as palpitations, lightheadedness, or dyspnea, but cardiac arrest is not imminent.  
Symptomatic tachycardia usually occurs at rates  $\geq 150$  beats per minute. Patients symptomatic with heart rates  $< 150$  likely have impaired cardiac function such as CHF.
- **Serious Signs / Symptoms:**  
Hypotension. Acutely altered mental status. Signs of shock / poor perfusion. Chest pain with evidence of ischemia (STEMI, T wave inversions or depressions.) Acute CHF.
- Search for underlying cause of tachycardia such as fever, sepsis, dyspnea, etc.
- If patient has history or 12 Lead ECG reveals Wolfe Parkinson White (WPW), DO NOT administer a Calcium Channel Blocker (e.g. Diltiazem) or Beta Blockers. Use caution with Adenosine and give only with defibrillator available.
- Typical sinus tachycardia is in the range of 100 to (200 - patient's age) beats per minute.
- **Regular Narrow-Complex Tachycardias:**  
Vagal maneuvers and adenosine are preferred. Vagal maneuvers may convert up to 25 % of SVT.  
Adenosine should be pushed rapidly via proximal IV site followed by 20 mL Normal Saline rapid flush.  
Agencies using both calcium channel blockers and beta blockers should choose one primarily. Giving the agents sequentially requires **Contact of Medical Control**. This may lead to profound bradycardia / hypotension.
- **Irregular Tachycardias:**  
First line agents for rate control are calcium channel blockers or beta blockers.  
Agencies using both calcium channel blockers and beta blockers should choose one primarily. Giving the agents sequentially requires **Contact of Medical Control**. This may lead to profound bradycardia / hypotension.  
Adenosine may not be effective in identifiable atrial fibrillation / flutter, yet is not harmful and may help identify rhythm.  
Amiodarone may be given in CHF, risk of rhythm conversion in patients with arrhythmia  $> 48$  hours.
- **Synchronized Cardioversion:**  
Recommended to treat UNSTABLE Atrial Fibrillation, Atrial Flutter and Monomorphic-Regular Tachycardia (VT.)
- Monitor for hypotension after administration of Calcium Channel Blockers or Beta Blockers.
- Document all rhythm changes with monitor strips and obtain monitor strips with each therapeutic intervention.

## Disposition:

**EMS Transport:**      **ALS:**   All patients

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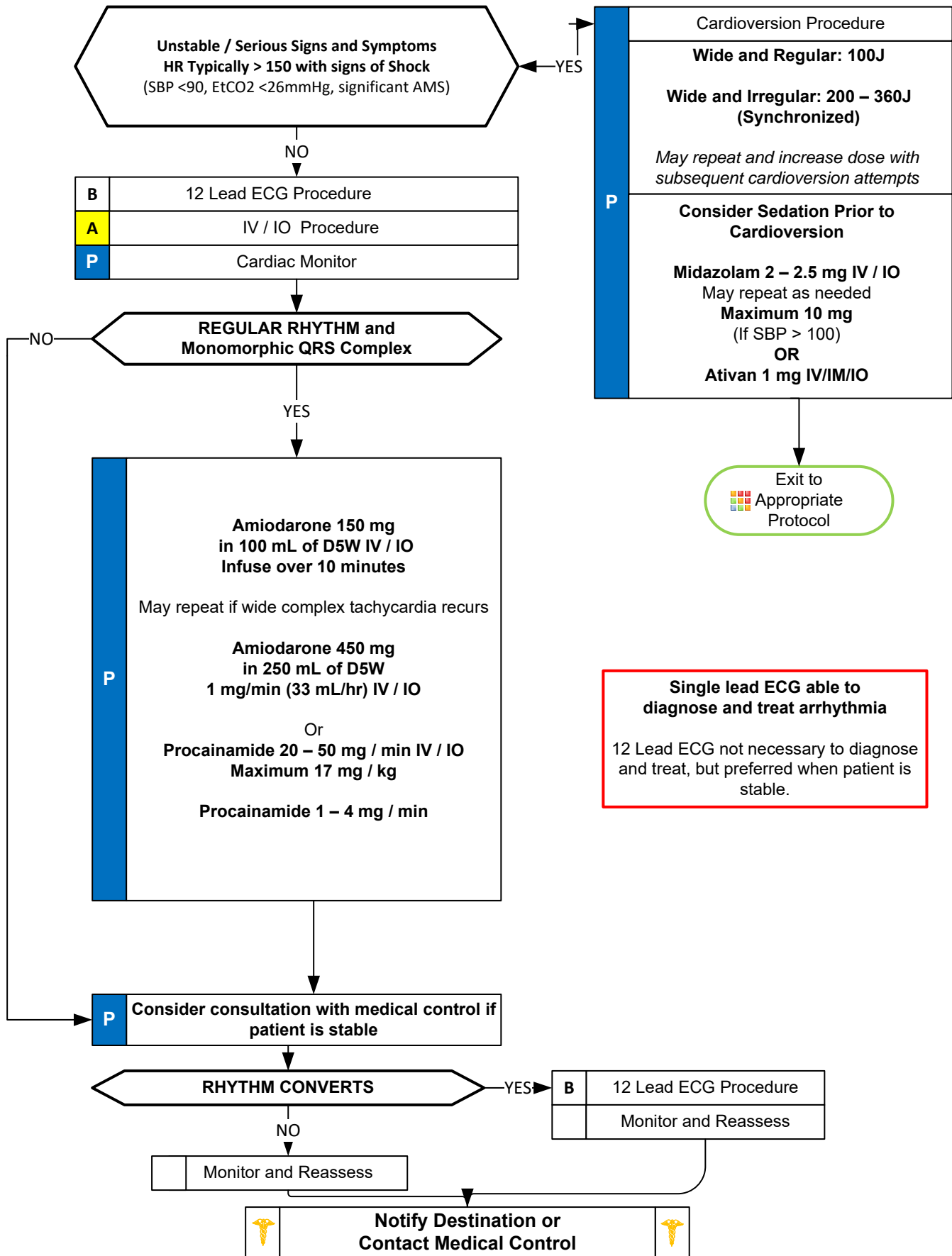




# Adult Tachycardia



## Wide Complex ( $\geq 0.12$ sec) REGULAR RHYTHM

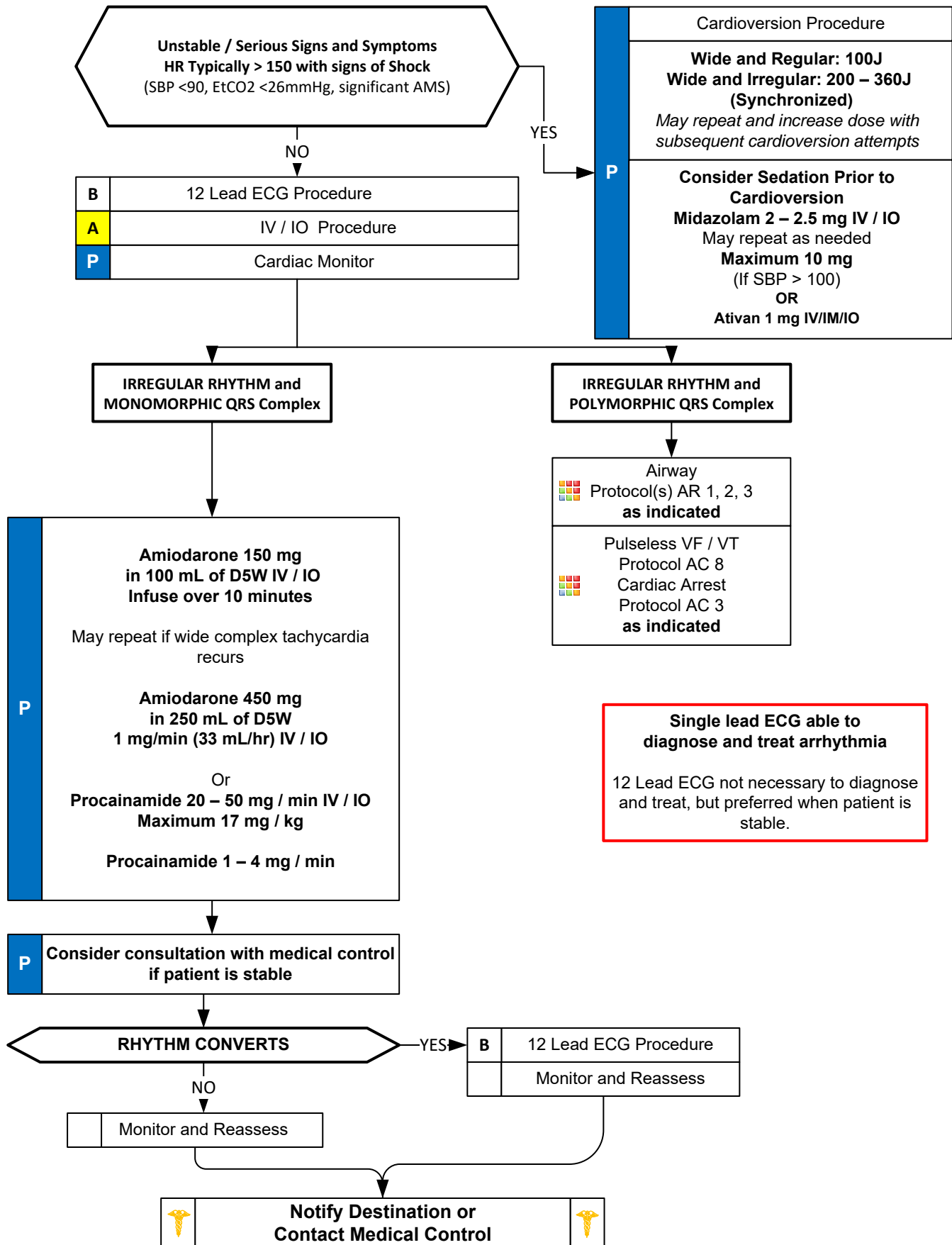




# Adult Tachycardia



## Wide Complex ( $\geq 0.12$ sec) IRREGULAR RHYTHM





# Adult Tachycardia Wide Complex ( $\geq 0.12$ sec)



## Pearls

- **Recommended Exam: Mental Status, Skin, Neck, Lung, Heart, Abdomen, Back, Extremities, Neuro**
- **Most important goal is to differentiate the type of tachycardia and if STABLE or UNSTABLE and SYMPTOMATIC.**
- **Rhythm should be interpreted in the context of symptoms**
- **Unstable condition**
  - **Condition which acutely impairs vital organ function and cardiac arrest may be imminent.**
  - **If at any point patient becomes unstable move to unstable arm in algorithm.**
- **Symptomatic condition**

Arrhythmia is causing symptoms such as palpitations, lightheadedness, or dyspnea, but cardiac arrest is not imminent.

Symptomatic tachycardia usually occurs at rates  $\geq 150$  beats per minute. Patients symptomatic with heart rates  $< 150$  likely have impaired cardiac function such as CHF.
- **Serious Signs / Symptoms:**

Hypotension. Acutely altered mental status. Signs of shock / poor perfusion. Chest pain with evidence of ischemia (STEMI, T wave inversions or depressions.) Acute congestive heart failure.
- **Search for underlying cause of tachycardia such as fever, sepsis, dyspnea, etc.**
- **If patient has history or 12 Lead ECG reveals Wolfe Parkinson White (WPW), DO NOT administer a Calcium Channel Blocker (e.g., Diltiazem) or Beta Blockers. Use caution with Adenosine and give only with defibrillator available.**
- **Search for underlying cause of tachycardia such as fever, sepsis, dyspnea, etc.**
- **Typical sinus tachycardia is in the range of 100 to (220 – patients age) beats per minute.**
- **Regular Wide-Complex Tachycardias:**
  - **Unstable condition:**

Immediate defibrillation if pulseless and begin CPR.
  - **Stable condition:**

Typically VT or SVT with aberrancy (Patients with RBBB or LBBB). Adenosine may be given if regular and monomorphic.

Giving multiple anti-arrhythmics requires contact of medical control.
- **Irregular Tachycardias:**

Wide-complex, irregular tachycardia: Do not administer calcium channel, beta blockers, or adenosine as this may cause paradoxical increase in ventricular rate. This will usually require cardioversion. Contact medical control.

In patients with concern about WPW, contact Medical Control prior to intervention unless patient requires cardioversion, in which case cardioversion is appropriate treatment
- **Polymorphic / Irregular Tachycardia:**

This situation is usually unstable and immediate defibrillation is warranted.

When associated with prolonged QT this is likely Torsades de pointes: Give 2 gm of Magnesium Sulfate slow IV / IO.

Without prolonged QT likely related to ischemia and Magnesium may not be helpful.
- **Document all rhythm changes with monitor strips and obtain monitor strips with each therapeutic intervention.**

## Disposition:

**EMS Transport:**      **ALS:**    All patients

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# Ventricular Fibrillation Pulseless Ventricular Tachycardia



## Cardiac Arrest Protocol AC 3

	<b>Begin Continuous CPR Compressions</b> Push Hard ( $\geq 2$ inches) Push Fast (110 - 120 / min) Change Compressors every 2 minutes (sooner if fatigued) (Limit changes / pulse checks $\leq 10$ seconds)  <b>At the end of each 2 minute cycle</b> Check AED / ECG Monitor If shockable rhythm, deliver shock and immediately continue chest compressions
	Search for Reversible Causes
<b>A</b>	IV / IO Procedure  Epinephrine (1:10,000) 1 mg IV / IO Repeat every 3 to 5 minutes

### Reversible Causes

Hypovolemia  
Hypoxia  
Hydrogen ion (acidosis)  
Hypothermia  
Hypo / Hyperkalemia  
  
Tension pneumothorax  
Tamponade; cardiac  
Toxins  
Thrombosis; pulmonary  
(PE)  
Thrombosis; coronary  
(MI)

### AT ANY TIME

Return of  
Spontaneous  
Circulation



Go to  
Post Resuscitation  
Protocol AC 9

	<b>Continue CPR Compressions</b> Push Hard ( $\geq 2$ inches) Push Fast (110 - 120 / min) Change Compressors every 2 minutes (sooner if fatigued) (Limit changes / pulse checks $\leq 10$ seconds)  <b>If Rhythm Refractory</b> Continue CPR and give Agency specific Anti- arrhythmics and Epinephrine Continue CPR up to point where you are ready to defibrillate with device charged. Repeat pattern during resuscitation.
<b>P</b>	Amiodarone 300 mg IV / IO May repeat if refractory Amiodarone 150 mg IV / IO  Refractory Magnesium 2 gm IV / IO
	<b>Refractory after 2 Defibrillations Attempts</b> Change location of defibrillation pads <i>if available</i>
	<b>Refractory after 4 Defibrillations Attempts</b> Consider Medical Control for Dual Sequential Defibrillation Procedure <i>if available</i>



Notify Destination or  
Contact Medical Control



Adult Cardiac Protocol Section



# Ventricular Fibrillation Pulseless Ventricular Tachycardia



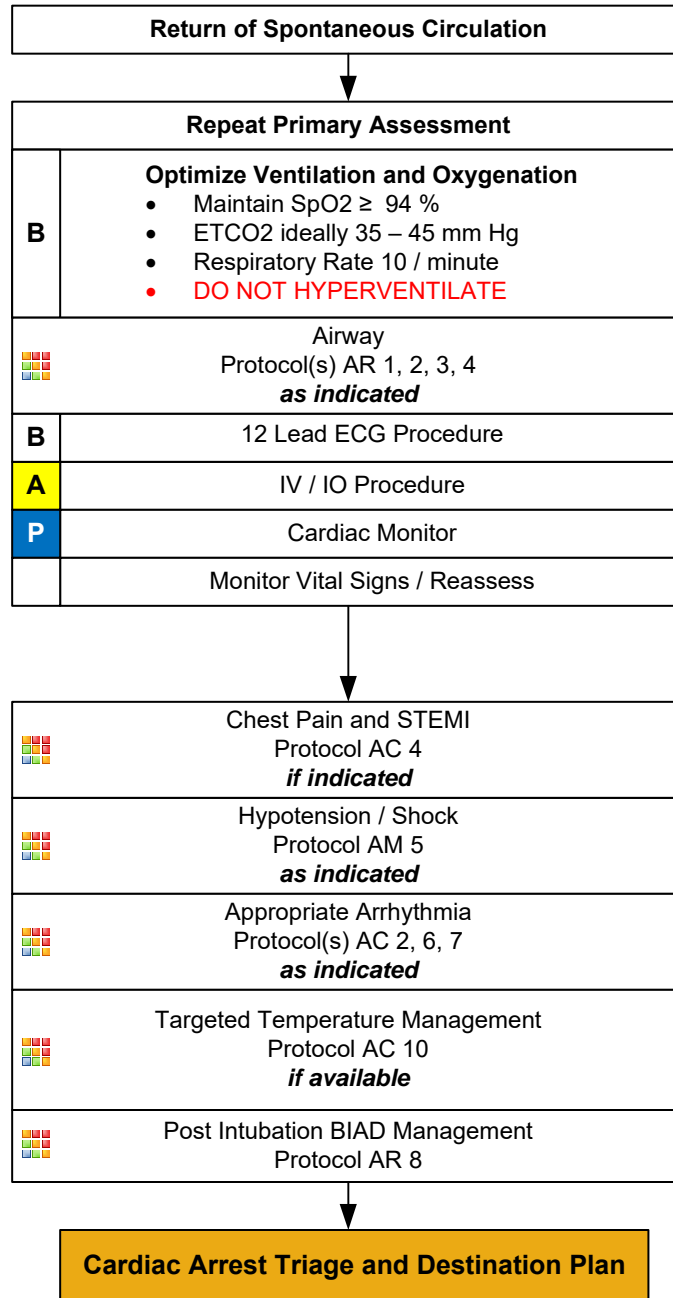
- **Pearls**
- **Recommended Exam: Mental Status, neuro, heart, and lung**
- **Team Focused Approach / Pit-Crew Approach recommended; assigning responders to predetermined tasks.**
- **Refer to optional protocol or development of local agency protocol.**
- **Efforts should be directed at high quality and continuous compressions with limited interruptions and early defibrillation when indicated.**
- **Consider early IO placement if available and / or difficult IV access anticipated.**
- **DO NOT HYPERVENTILATE:** If no advanced airway (BIAD, ETT) compression to ventilation ratio is 30:2. If advanced airway in place, ventilate 10 breaths per minute with continuous, uninterrupted compressions.
- **Do not interrupt compressions to place endotracheal tube. Consider BIAD first to limit interruptions.**
- **Passive oxygenation optional in agencies practicing Team Focused Approach / Pit-Crew Approach.**
- **Reassess and document BIAD and / or endotracheal tube placement and EtCO<sub>2</sub> frequently, after every move, and at transfer of care.**
- **IV / IO access and drug delivery is secondary to high-quality chest compressions and early defibrillation.**
- **Defibrillation:** Follow manufacture's recommendations concerning defibrillation / cardioversion energy when specified.
- **End Tidal CO<sub>2</sub> (EtCO<sub>2</sub>)**
  - If EtCO<sub>2</sub> is < 10 mmHg, improve chest compressions.
  - If EtCO<sub>2</sub> spikes, typically > 40 mmHg, consider Return of Spontaneous Circulation (ROSC)
- **Avoid Procainamide in CHF or prolonged QT.**
- **Magnesium Sulfate is not routinely recommended during cardiac arrest, but may help with Torsades de points, Low Magnesium States (Malnourished / alcoholic), and Suspected Digitalis Toxicity**
- **If no IV / IO, with drugs that can be given down ET tube, double dose and then flushed with 5 ml of Normal Saline followed by 5 quick ventilations. IV / IO is the preferred route when available.**
- **Return of spontaneous circulation: Heart rate should be > 60 when initiating anti-arrhythmic infusions.**
- **In patients with chronic kidney disease or end-stage renal disease (dialysis patients), consider 1 g Calcium Chloride.**

## Disposition:

**EMS Transport:**      **ALS:**    All patients



# Post Resuscitation



## Reversible Causes

Hypovolemia  
Hypoxia  
Hydrogen ion (acidosis)  
Hypothermia  
Hypo / Hyperkalemia  
  
Tension pneumothorax  
Tamponade; cardiac  
Toxins  
Thrombosis; pulmonary (PE)  
Thrombosis; coronary (MI)

Arrhythmias are common and usually self limiting after ROSC



If Arrhythmia Persists follow Rhythm Appropriate Protocol



# Post Resuscitation



- **Pearls**
- **Recommended Exam: Mental Status, Neck, Skin, Lungs, Heart, Abdomen, Extremities, Neuro**
- **Continue to search for potential cause of cardiac arrest during post-resuscitation care.**
- **Hyperventilation is a significant cause of hypotension and recurrence of cardiac arrest in the post resuscitation phase and must be avoided at all costs. Titrate FiO2 to maintain SpO2 of  $\geq 94\%$ .**
- **Initial End tidal CO2 may be elevated immediately post-resuscitation, but will usually normalize. While goal is 35 – 45 mmHg avoid hyperventilation to achieve.**
- **Most patients immediately post resuscitation will require ventilatory assistance.**
- **Titrate fluid resuscitation and vasopressor administration to maintain SBP of 90 – 100 mmHg or Mean Arterial Pressure (MAP) of 65 – 80 mmHg.**
- **STEMI:**
- **Transport to a primary cardiac catheter facility with evidence of STEMI on 12 Lead ECG.**
- **Targeted Temperature Management:**
- **Maintain core temperature between 33 - 36°C.**
- **Consider transport to facility capable of managing the post-arrest patient including hypothermia therapy, cardiology / cardiac catheterization, intensive care service, and neurology services.**
- **Consider Epinephrine infusion in the patient with recurrent episodes of cardiac arrest that respond to Epinephrine injections. Consider utilizing multiple pressors together as necessary to maintain blood pressure and HR.**
- **While transcutaneous pacing may otherwise be indicated in the ischemic heart, consider the danger of missed re-arrest while pacing. In general titrate pressors as needed and only attempt pacing if indicated in the post-ROSC patient if mechanical capture can absolutely be verified (ie finger on the pulse AND good blood pressure) and constantly monitored.**
- **The condition of post-resuscitation patients fluctuates rapidly and continuously, and they require close monitoring. Appropriate post-resuscitation management may best be planned in consultation with medical control.**

## Disposition:

**EMS Transport:**      **ALS:** All patients



# Post Resuscitation



## POST-ROSC Adult Cardiac Arrest Checklist

- ☐ ASSESS ETCO<sub>2</sub> (should be >20 with good waveform)
- ☐ Do not try to obtain a "normal" ETCO<sub>2</sub> by increasing respiratory rate
- ☐ FINGER ON PULSE; maintain for 10 minutes; consider delaying transport during this time period if appropriate
- ☐ Continuous visualization of cardiac monitor rhythm by paramedic personnel
- ☐ Check O<sub>2</sub> supply and pulse O<sub>x</sub> to TITRATE O<sub>2</sub> lpm to SaO<sub>2</sub> 94-99%
- ☐ Obtain 12 lead EKG; if STEMI evident call CODE STEMI to the hospital and transmit if possible
- ☐ Obtain Blood Pressure- Pressor agent (s) indicated for SBP <90 or MAP <60
- ☐ Assess for and TREAT bradycardias < 60 bpm
- ☐ Evaluate for post-resuscitation airway placement (e.g. ETT)
- ☐ consider using passive oxygenation with nasal cannula if placing ETT
- ☐ Scene manager establishes controlled egress method
- ☐ When patient is moved:
  - ☐ Finger on the pulse
  - ☐ Continuous ETCO<sub>2</sub> monitoring
  - ☐ Continuous assessment of cardiac rhythm
- ☐ Mask is available for BVM in case advanced airway fails
- ☐ Once in ambulance, confirm pulse, breath sounds, SaO<sub>2</sub>, ETCO<sub>2</sub>, and cardiac rhythm
- ☐ Appropriate personnel present in the back of the ambulance for transport
- ☐ Unless patient is following verbal commands, initiate hypothermia therapy
- ☐ Ensure transfer of paperwork including patient identification from scene manager to code commander
- ☐ Necessary information includes patient name, DOB, and medical history when available
- ☐ Inform destination hospital of incoming ROSC patient

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# Target Temperature Management



## History

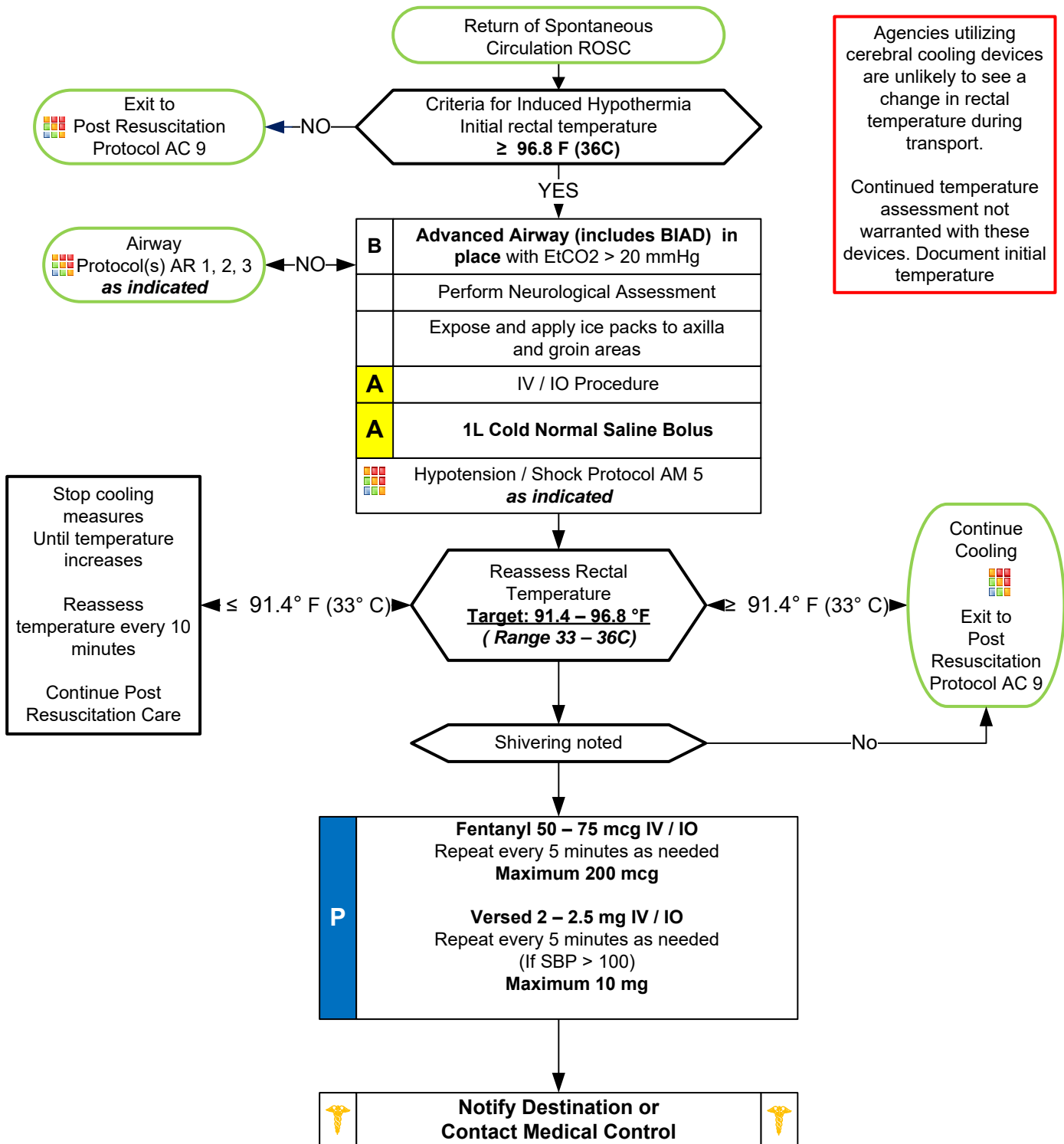
- Non-traumatic cardiac arrests (drownings and hanging / asphyxiation are permissible in this protocol.)
- All presenting rhythms are permissible in this protocol
- Age 18 or greater

## Signs and Symptoms

- Cardiac arrest
- Return of Spontaneous Circulation post-cardiac arrest

## Differential

- Continue to address specific differentials associated with the arrhythmia



Agencies utilizing cerebral cooling devices are unlikely to see a change in rectal temperature during transport.

Continued temperature assessment not warranted with these devices. Document initial temperature

Adult Cardiac Protocol Section



# Target Temperature Management



## Pearls

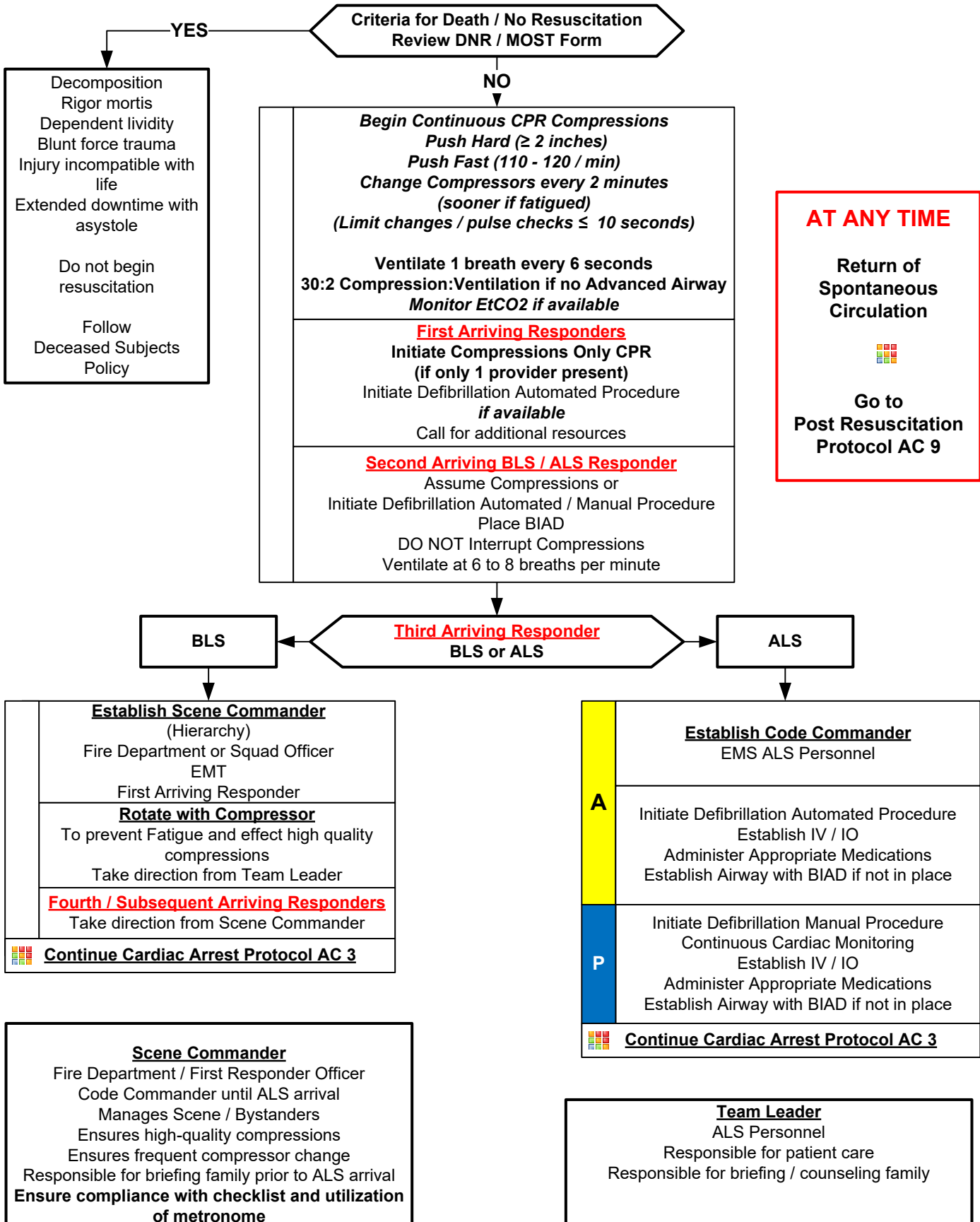
- **Criteria for Targeted Temperature Management:**
  - Return of spontaneous circulation not related to blunt / penetrating trauma or hemorrhage with ventricular fibrillation / tachycardia and non-shockable arrhythmias.
  - Temperature greater than 96.8°F (36° C).
  - Advanced airway (including BIAD) in place with no purposeful response to verbal commands.
  - Infusion of cold saline is NOT recommended in the prehospital setting.
- Hyperventilation is a significant cause of hypotension and recurrence of cardiac arrest in the post resuscitation phase and must be avoided at all costs.
- Titrate FiO2 to maintain SpO2 of ≥ 94%.
- Initial End tidal CO2 may be elevated immediately post-resuscitation, but will usually normalize. While goal is 35 – 45 mmHg avoid hyperventilation to achieve.
- Most patients immediately post resuscitation will require ventilatory assistance.
- If no advanced airway in place obtained, cooling may only be initiated on order from medical control.
- Titrate fluid resuscitation and vasopressor administration to maintain SBP of 90 – 100 mmHg or Mean Arterial Pressure (MAP) of 65 – 80 mmHg.
- **STEMI**
  - Transport to a primary cardiac catheter facility with evidence of STEMI on 12 Lead ECG.
- Consider transport to facility capable of managing the post-arrest patient including hypothermia therapy, cardiac catheterization and intensive care service.
- Utilization of this protocol mandates transport to facility capable of managing the post-arrest patient and continuation of induced hypothermia therapy.
- Maintain patient modesty. Undergarments may remain in place during cooling.

## Disposition:

EMS Transport:      ALS: All patients



# Team Focused CPR





# Team Focused CPR



## Pearls

- This protocol is optional and given only as an example. Agencies may and are encouraged to develop their own.
- Team Focused Approach / Pit-Crew Approach recommended; assign responders to predetermined tasks. Refer to optional protocol or development of local agency protocol.
- Efforts should be directed at high quality and continuous compressions with limited interruptions and early defibrillation when indicated.
- DO NOT HYPERVENTILATE: If no advanced airway (BIAD, ETT) compression to ventilation ratio is 30:2. If advanced airway in place, ventilate 10 breaths per minute with continuous, uninterrupted compressions.
- Do not interrupt compressions to place endotracheal tube. Consider BIAD first to limit interruptions.
- Passive oxygenation optional in agencies practicing Team Focused Approach / Pit-Crew Approach.  
Do not interrupt compressions to place endotracheal tube. Consider BIAD first to limit interruptions.
- Success is based on proper planning and execution. Procedures require space and patient access. Make room to work.



# Emergencies Involving Ventricular Assist Devices (VAD or LVAD)



## History

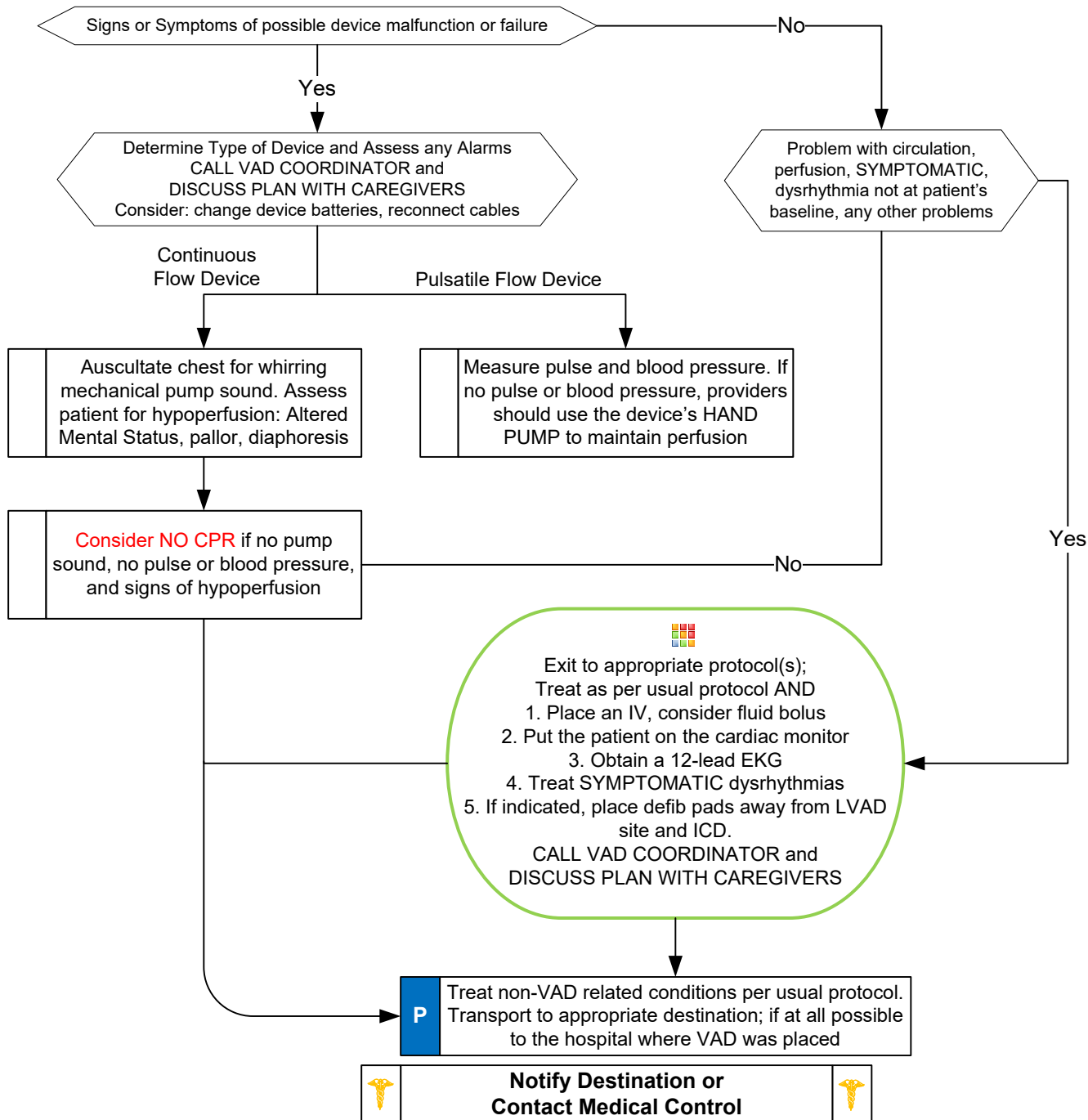
- End-stage Heart Failure
- Patient has surgically-implanted pump that assists the action of one or both ventricles
- Patient may or may not be on a list for cardiac transplantation

## Signs and Symptoms

- The flow through many of these devices is not pulsatile, therefore THE PATIENT MAY NOT HAVE A PULSE AT BASELINE. For this reason pulse oximetry readings may also be inaccurate
- Altered Mental Status may be the only indicator of a problem
- Consider both VAD-related and non-VAD-related problems

## Differential

- Stroke
- Cardiac Arrest
- Dysrhythmia different from patient's baseline
- Infection
- Bleeding (VAD patients are anticoagulated)
- Dehydration
- Cardiac Tamponade
- Device problem such as low battery or disconnected cable





# Emergencies Involving Ventricular Assist Devices (VAD or LVAD)



## Pearls

- **ALWAYS** talk to family/caregivers as they have specific knowledge and skills. **CALL THE VAD COORDINATOR EARLY** as per patient / family instructions or as listed on the device. They are available 24/7 and should be an integral part of the treatment plan.
- **QUESTIONS TO ASK: DOES THE PATIENT HAVE A DNR?** Can the patient be cardioverted or defibrillated if needed? Can **CHEST COMPRESSIONS** be performed in case of pump failure?
- **Deciding when to initiate chest compressions is very difficult. Consider that chest compressions MAY CAUSE DEATH BY EXANGUINATION** if the device becomes dislodged. However, if the pump has stopped the heart will not be able to maintain perfusion and the patient will likely die. Ideally, plan the decision in advance with a responsive patient and the VAD coordinator. If a VAD patient is unresponsive and pulseless with a non-functioning pump and has previously indicated a desire for resuscitative efforts, begin compressions. Contact the VAD coordinator and medical control.
- Common complications in VAD patients include Stroke and TIA (incidence up to 25%), bleeding, dysrhythmia, and infection.
- The Cardiac Monitor and 12 lead EKG are not affected by the VAD and will provide important information
- VAD patients are preload dependent. Consider that a FLUID BOLUS can often reverse hypoperfusion
- Transport patients with ALL device equipment including any instructions, hand pumps, backup batteries, primary and secondary controllers, as well as any knowledgeable family members or caregivers.

## Contact Numbers:

**UNC** VAD Coordinator – (919) 216-2095 for 24h On Call pager

**DUKE** VAD Coordinator – (919) 970-0460 for the 24h On Call pager

## Disposition:

**EMS Transport: ALS:** All patients



# Adult Medical





# Allergic Reaction / Anaphylaxis



## History

- Onset and location
- Insect sting or bite
- Food allergy / exposure
- Medication allergy / exposure
- New clothing, soap, detergent
- Past history of reactions
- Past medical history
- Medication history

## Signs and Symptoms

- Itching or hives
- Coughing / wheezing or respiratory distress
- Chest or throat constriction
- Difficulty swallowing
- Hypotension or shock
- Edema
- N/V

## Differential

- Urticaria (rash only)
- Anaphylaxis (systemic effect)
- Shock (vascular effect)
- Angioedema (drug induced)
- Aspiration / Airway obstruction
- Vasovagal event
- Asthma or COPD
- CHF

Assess Symptom Severity / Suspected Exposure to Allergen

**MILD**  
Skin Only

B	Diphenhydramine 25 - 50 mg PO
	IV Procedure <i>if indicated</i>
	Diphenhydramine 25 - 50 mg PO / IV / IM / IO

B	Monitor and Reassess Monitor for Worsening Signs and Symptoms
---	---

**MODERATE and SEVERE**  
2 + Body Systems  
With or without Hypotension

B	Epinephrine 1:1000 IM 0.3 – 0.5 mg <i>May repeat up to three (3) times</i>
	Diphenhydramine 25 - 50 mg PO <i>See Pearls</i>
	Albuterol Nebulizer 2.5 – 5 mg Repeat as needed x 3 <i>if indicated</i>
A	Diphenhydramine 25 - 50 mg IV / IM / IO <i>if not already given PO</i>
	IV / IO Procedure
	Albuterol Nebulizer 2.5 – 5 mg +/- Ipratropium 0.5 mg Repeat as needed x 3 <i>if indicated</i>
P	Normal Saline Bolus 500 mL IV / IO Repeat as needed <b>Maximum 2 Liters</b>
	If not improving Epinephrine 1:1,000,000 Administer in 1000 mL/min IV/IO Titrate to effect
	Methylprednisolone 125 mg IV / IO

	Airway Protocol(s) AR 1 - 4 <i>if indicated</i>
	Hypotension / Shock Protocol AM 5 <i>if indicated</i>

**Notify Destination or  
Contact Medical Control**

Adult Medical Protocol Section

AM 1

Any local EMS System changes to this document must follow the NC OEMS Protocol Change Policy and be approved by OEMS



# Allergic Reaction / Anaphylaxis



Calculations valid for **1 mg Epinephrine mixed into 1000 ml of Normal Saline.**  
Administer with a **10 gtt (Macro gtt)** setup.

Epinephrine Infusion Rate (mcg/min)	Seconds per 1 Drop	Drops per Minute
1	6	10
2	3	20
3	2	30
4	1.5	40
5	1.2	50
6	1	60
7	0.9	67
8	0.8	75
9	0.7	86
10	0.6	100

Use the 10 gtt (Macro gtt) chamber!

This drip chart is intended only for use by approved EMT-P providers within Orange County, NC.

Adult Medical Protocol Section

## Pearls

- **Recommended Exam: Mental Status, Skin, Heart, Lungs, Abdominal**
- **Anaphylaxis is an acute and potentially lethal multisystem allergic reaction.**
- **Epinephrine administration:**  
Drug of choice and the **FIRST** drug that should be administered in acute anaphylaxis (Moderate / Severe Symptoms.) IM Epinephrine should be administered in priority before or during attempts at IV or IO access. Diphenhydramine and steroids have no proven utility in Moderate / Severe anaphylaxis and may be given only After Epinephrine. Diphenhydramine and steroids should NOT delay repeated Epinephrine administration. In Moderate and Severe anaphylaxis Diphenhydramine may decrease mental status. Oral Diphenhydramine should NOT be given to a patient with decreased mental status and / or a hypotensive patient as this may cause nausea and / or vomiting.
- **Symptom Severity Classification:**  
Mild symptoms:  
Flushing, hives, itching, erythema with normal blood pressure and perfusion.  
Moderate symptoms:  
Flushing, hives, itching, erythema plus respiratory (wheezing, dyspnea, hypoxia) or gastrointestinal symptoms (nausea, vomiting, abdominal pain) with normal blood pressure and perfusion.  
Severe symptoms:  
Flushing, hives, itching, erythema plus respiratory (wheezing, dyspnea, hypoxia) or gastrointestinal symptoms (nausea, vomiting, abdominal pain) with hypotension/poor perfusion or isolated hypotension.
- Allergic reactions may occur with only respiratory and gastrointestinal symptoms and have no rash / skin involvement.
- **Angioedema** is seen in moderate to severe reactions and is swelling involving the face, lips or airway structures. This can also be seen in patients taking blood pressure medications like Prinivil / Zestril (lisinopril)-typically end in -il.
- **Hereditary Angioedema** involves swelling of the face, lips, airway structures, extremities, and may cause moderate to severe abdominal pain. Some patients are prescribed specific medications to aid in reversal of swelling. **Paramedic may assist or administer this medication per patient / package instructions.**
- 12 lead ECG and cardiac monitoring should NOT delay administration of epinephrine.
- EMR / EMT may administer Epinephrine IM and may administer from EMS supply.
- EMR / EMT may administer Epinephrine IM via AutoInjector or manual draw-up.
- EMT may administer diphenhydramine by oral route only and may administer from EMS supply.
- EMT may administer Albuterol if patient already prescribed and may administer from EMS supply.
- The shorter the onset from exposure to symptoms the more severe the reaction.

## Disposition:

**EMS Transport:** **ALS:** All patients who exhibit abnormal vital signs, facial swelling, and/or receive Epinephrine  
**BLS:** Increased rash, not improved with Diphenhydramine  
Persistent (or recurrent) rash



# Diabetic; Adult



## History

- Past medical history
- Medications
- Recent blood glucose check
- Last meal

## Signs and Symptoms

- Altered mental status
- Combative / irritable
- Diaphoresis
- Seizures
- Abdominal pain
- Nausea / vomiting
- Weakness
- Dehydration
- Deep / rapid breathing

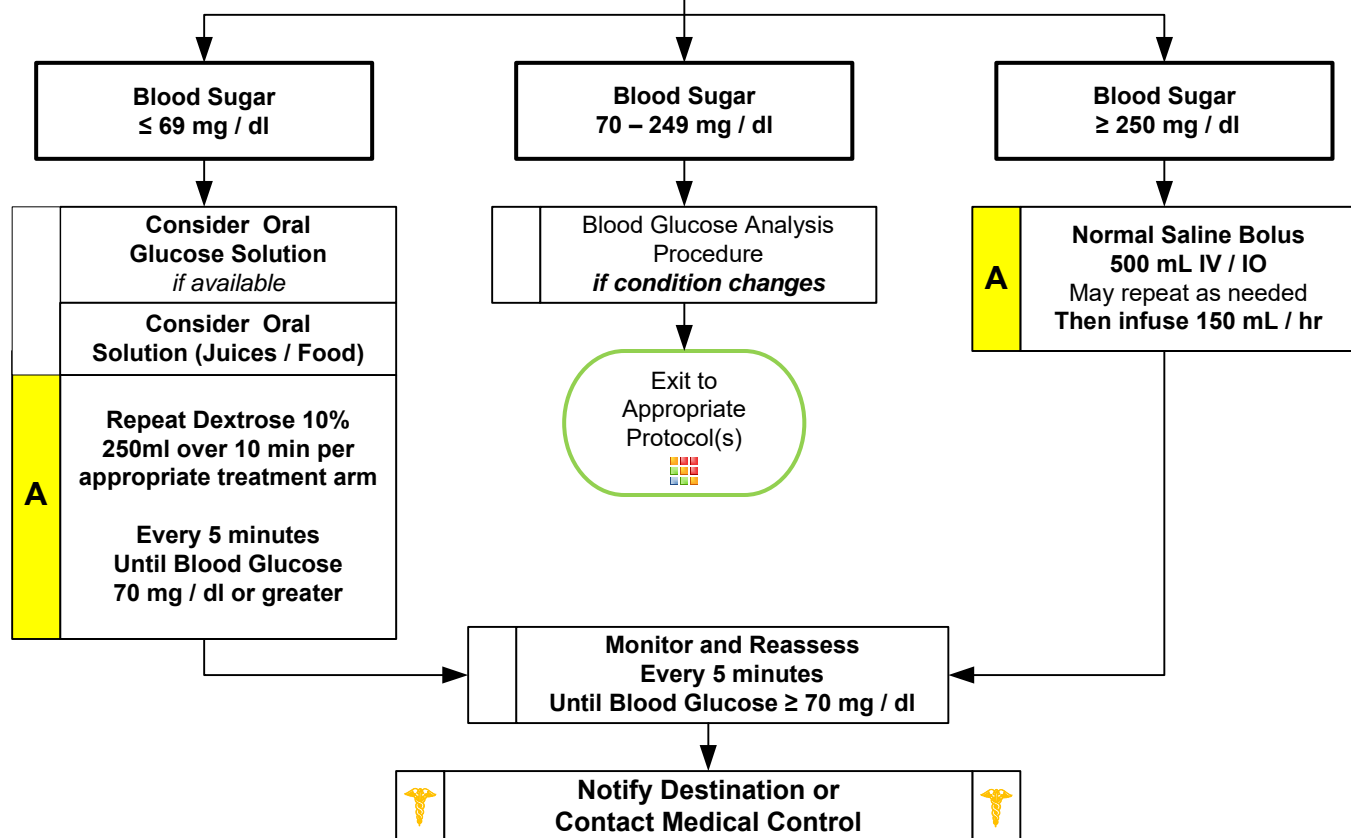
## Differential

- Alcohol / drug use
- Toxic ingestion
- Trauma; head injury
- Seizure
- CVA
- Altered baseline mental status

	Blood Glucose Analysis Procedure
<b>B</b>	12 Lead ECG Procedure <i>if indicated</i>
<b>A</b>	IV / IO Procedure
<b>P</b>	Cardiac Monitor
	Altered Mental Status Protocol UP 4 <i>if indicated</i>
	Hypotension / Shock Protocol AM 5 <i>if indicated</i>
	Suspected Stroke Protocol AM 7 <i>if indicated</i>
	Seizure Protocol UP 13 <i>if indicated</i>

**A**

Blood Glucose  $\leq 69$  mg / dl and symptomatic  
No venous access  
**Glucagon 1 – 2 mg IM**  
Repeat in 15 minutes if needed



Adult Medical Protocol Section



# Diabetic; Adult

## Pearls

- **Recommended exam: Mental Status, Skin, Respirations and effort, Neuro.**
- **Patients with prolonged hypoglycemia may not respond to glucagon.**
- **Do not administer oral glucose to patients that are not able to swallow or protect their airway.**
- **Quality control checks should be maintained per manufacturers recommendation for all glucometers.**
- **Patient's refusing transport to medical facility after treatment of hypoglycemia:**
  - Blood sugar must be  $\geq 80$ , patient has ability to eat and availability of food with responders on scene.
  - Patient must have known history of diabetes and not taking any oral diabetic agents.
  - Patient returns to normal mental status and has a normal neurological exam with no new neurological deficits.
  - Must demonstrate capacity to make informed health care decisions. See Universal Patient Care Protocol UP-1.
  - Otherwise contact medical control.
- **Hypoglycemia with Oral Agents:**
  - Patient's taking oral diabetic medications should be encouraged to allow transportation to a medical facility.
  - They are at risk of recurrent hypoglycemia that can be delayed for hours and require close monitoring even after normal blood glucose is established.
  - Not all oral agents have prolonged action so Contact Medical Control for advice.
  - Patient's who meet criteria to refuse care should be instructed to contact their physician immediately and consume a meal.
- **Hypoglycemia with Insulin Agents:**
  - Many forms of insulin now exist. Longer acting insulin places the patient at risk of recurrent hypoglycemia even after a normal blood glucose is established.
  - Not all insulin have prolonged action so Contact Medical Control for advice.
  - Patient's who meet criteria to refuse care should be instructed to contact their physician immediately and consume a meal.
- **Congestive Heart Failure patients who have Blood Glucose  $> 250$ :**
  - Limit fluid boluses unless they have signs of volume depletion, dehydration, poor perfusion, hypotension, and / or shock.
- In extreme circumstances with no IV / IO access and no response to glucagon, D50 can be administered rectally. Contact medical control for advice.

## Disposition:

**EMS Transport:**

**ALS:** All patients other than listed below

**BLS:** Hypoglycemia with normal exam post Dextrose



# Dialysis / Renal Failure



## History

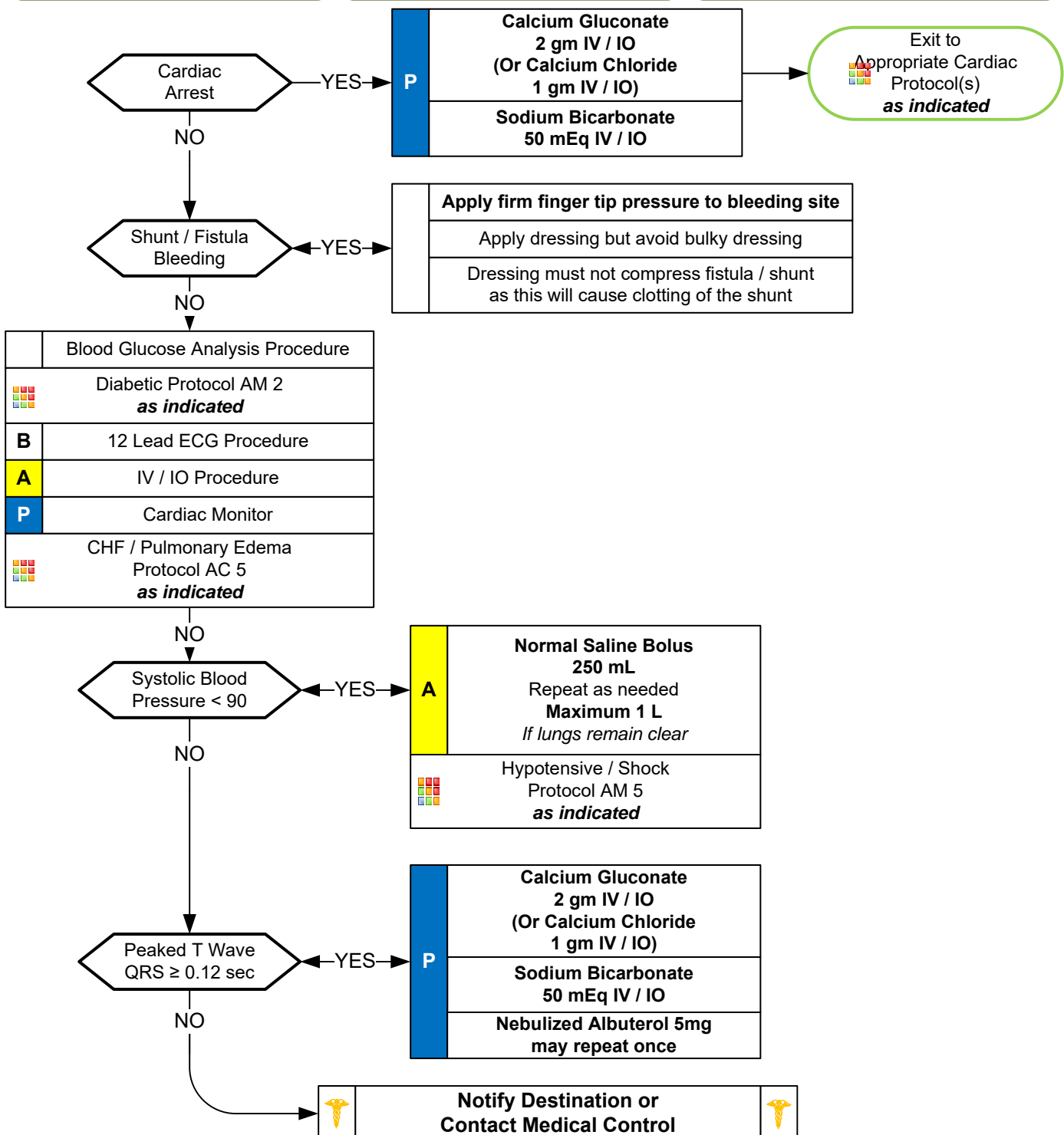
- Peritoneal or Hemodialysis
- Anemia
- Catheter access noted
- Shunt access noted
- Hyperkalemia

## Signs and Symptoms

- Hypotension
- Bleeding
- Fever
- Electrolyte imbalance
- Nausea and / or vomiting
- Altered Mental Status
- Seizure
- Arrhythmia

## Differential

- Congestive heart failure
- Pericarditis
- Diabetic emergency
- Sepsis
- Cardiac tamponade







# Dialysis / Renal Failure



## Pearls

- **Recommended exam: Mental status. Neurological. Lungs. Heart.**
- **Consider transport to medical facility capable of providing Dialysis treatment.**
- **Do not take Blood Pressure or start IV in extremity which has a shunt / fistula in place.**
- **Access of shunt indicated in the dead or near-dead patient only with no IV or IO access.**
- **If hemorrhage cannot be controlled with firm, uninterrupted direct pressure, application of tourniquet with uncontrolled dialysis fistula bleeding is indicated.**
- **Hemodialysis:**  
Process which removes waste from the blood stream and occurs about three times each week. Some patients do perform hemodialysis at home.
- **Peritoneal dialysis:**  
If patient complains of fever, abdominal pain, and / or back pain, bring the PD fluid bag, which has drained from the abdomen, to the hospital.

## **Complications of Dialysis Treatment:**

### Hypotension:

Typically responds to small fluid bolus of 250 mL Normal Saline. May result in angina, AMS, or arrhythmia.

### Filtration and decreased blood levels of some medications like some seizure medications:

### Disequilibrium syndrome:

Shift of metabolic waste and electrolytes causing weakness, dizziness, nausea and / or vomiting and seizures.

### Equipment malfunction:

Air embolism.  
Bleeding.  
Electrolyte imbalance.  
Fever.

- **Fever:**  
Consider sepsis in a dialysis patient with any catheter extending outside the body.
- Always consider Hyperkalemia in all dialysis or renal failure patients.
- Sodium Bicarbonate and Calcium Chloride / Gluconate should not be mixed. Ideally give in separate lines.
- Renal dialysis patients have numerous medical problems typically. Hypertension and cardiac disease are prevalent.

## **Disposition:**

### **EMS Transport:**

**BLS:** The patient has completed their last 3 dialysis sessions and has a complaint that otherwise would meet a BLS disposition

**ALS:** All Other patients



# Hypertension



## History

- Documented Hypertension
- Related diseases: Diabetes; CVA; Renal Failure; Cardiac Problems
- Medications for Hypertension
- Compliance with Hypertensive Medications
- Erectile Dysfunction medications
- Pregnancy

## Signs and Symptoms

### One of these

- Systolic BP 220 or greater
- Diastolic BP 120 or greater

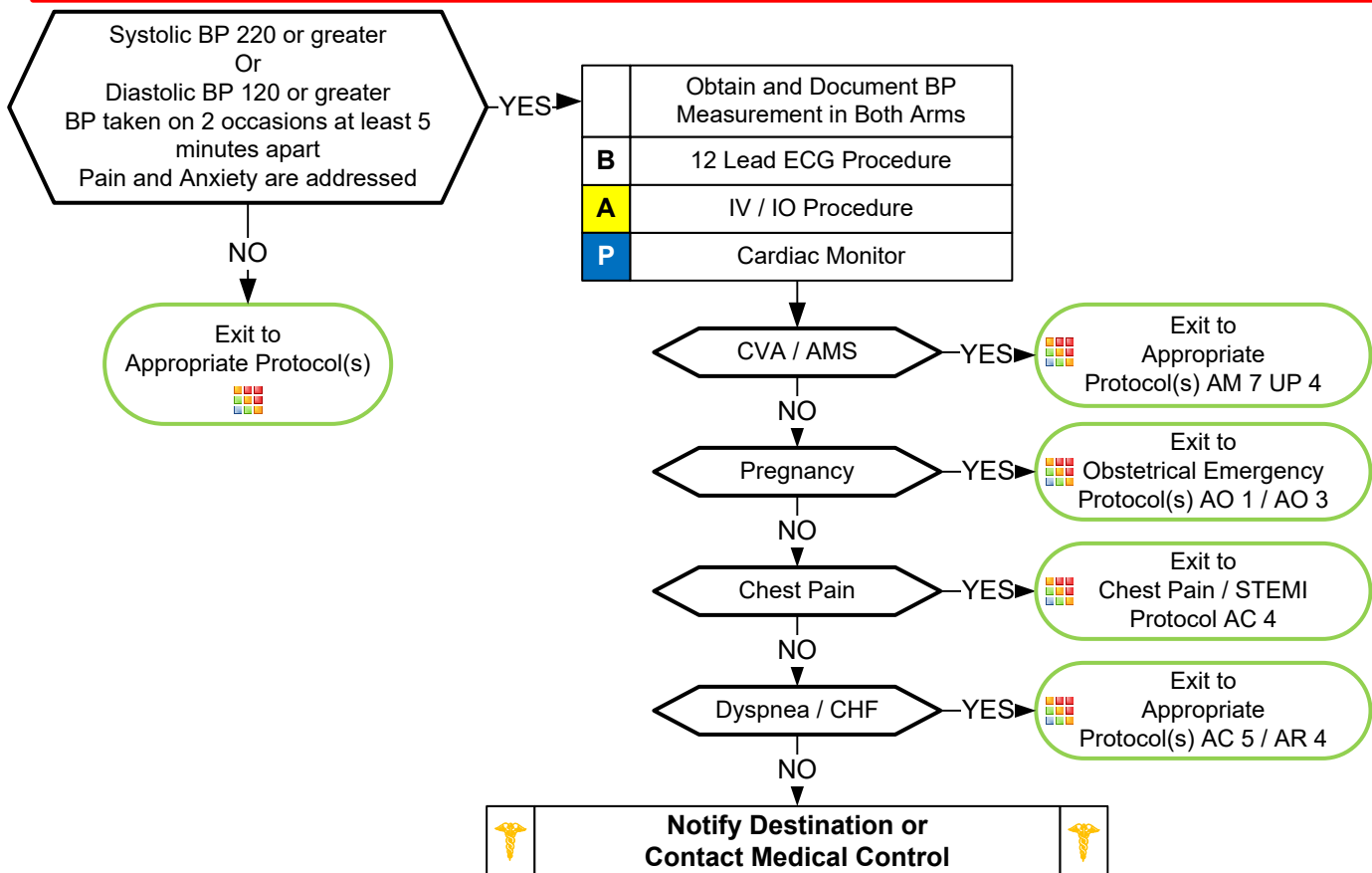
### AND at least one of these

- Headache
- Chest Pain
- Dyspnea
- Altered Mental Status
- Seizure

## Differential

- Hypertensive encephalopathy
- Primary CNS Injury  
Cushing's Response  
with Bradycardia and Hypertension
- Myocardial Infarction
- Aortic Dissection / Aneurysm
- Pre-eclampsia / Eclampsia

Hypertension is not uncommon especially in an emergency setting. Hypertension is usually transient and in response to stress and / or pain. A hypertensive emergency is based on blood pressure along with symptoms which suggest an organ is suffering damage such as MI, CVA or renal failure. This is very difficult to determine in the pre-hospital setting in most cases. Aggressive treatment of hypertension can result in harm. Most patients, even with significant elevation in blood pressure, need only supportive care. Specific complaints such as chest pain, dyspnea, pulmonary edema or altered mental status should be treated based on specific protocols and consultation with Medical Control.



## Pearls

- **Recommended Exam: Mental Status, Skin, Neck, Lung, Heart, Abdomen, Back, Extremities, Neuro**
- Elevated blood pressure is based on two to three sets of vital signs.
- Symptomatic hypertension is typically revealed through end organ dysfunction to the cardiac, CNS or renal systems.
- All symptomatic patients with hypertension should be transported with their head elevated at 30 degrees.
- Ensure appropriate size blood pressure cuff utilized for body habitus.

## Disposition:

**EMS Transport:**

**ALS:** All patients

AM 4

Any local EMS System changes to this document must follow the NC OEMS Protocol Change Policy and be approved by OEMS

Adult Medical Protocol Section



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# Hypotension / Shock



## History

- Blood loss - vaginal or gastrointestinal bleeding, AAA, ectopic
- Fluid loss - vomiting, diarrhea, fever
- Infection
- Cardiac ischemia (MI, CHF)
- Medications
- Allergic reaction
- Pregnancy
- History of poor oral intake

## Signs and Symptoms

- Restlessness, confusion
- Weakness, dizziness
- Weak, rapid pulse
- Pale, cool, clammy skin
- Delayed capillary refill
- Hypotension
- Coffee-ground emesis
- Tarry stools

## Differential

- Ectopic pregnancy
- Dysrhythmias
- Pulmonary embolus
- Tension pneumothorax
- Medication effect / overdose
- Vasovagal
- Physiologic (pregnancy)
- Sepsis

	Blood Glucose Analysis Procedure
<b>B</b>	12 Lead ECG Procedure
<b>A</b>	IV / IO Procedure
<b>P</b>	Cardiac Monitor
	Airway Protocol(s) <i>if indicated</i>
	Diabetic Protocol AM 2 <i>if indicated</i>

History and Exam Suggest Type of Shock

### Cardiogenic

Chest Pain: Cardiac and STEMI  
 Protocol AC 4  
 Appropriate Cardiac Protocol(s)  
*if indicated*

### Hypovolemic

Allergy Protocol AM 1  
*if indicated*  
 Suspected Sepsis Protocol UP 14  
*if indicated*  
 Multiple Trauma Protocol TB 6  
*if indicated*

### Distributive

### Obstructive

**P** Chest Decompression-Needle Procedure  
*if indicated*

<b>A</b>	<b>Normal Saline Bolus 500 mL IV</b> Repeat to effect SBP > 90 2 L Maximum
<b>P</b>	<b>Norepinephrine 1-10 mcg/min IV/IO</b> <b>OR</b> <b>Dopamine 2 – 20 mcg/kg/min IV / IO</b> Maintain SBP 90 – 100 mmHg Maintain MAP > 65 mmHg

**Notify Destination or Contact Medical Control**

Adult Medical Protocol Section

AM 5

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# Hypotension / Shock



## Pearls

- **Recommended Exam: Mental Status, Skin, Heart, Lungs, Abdomen, Back, Extremities, Neuro**
- Hypotension can be defined as a systolic blood pressure of less than 90. This is not always reliable and should be interpreted in context and patients typical BP if known. Shock may be present with a normal blood pressure initially.
- Shock often is present with normal vital signs and may develop insidiously. Tachycardia may be the only manifestation.
- Consider all possible causes of shock and treat per appropriate protocol.
- For non-cardiac, non-trauma hypotension, consider Dopamine when hypotension unresponsive to fluid resuscitation.
- **Hypovolemic Shock:**  
Hemorrhage, trauma, GI bleeding, ruptured aortic aneurysm or pregnancy-related bleeding.  
**Tranexamic Acid (TXA):**  
Agencies utilizing TXA must have approval from your T-RAC.
- **Cardiogenic Shock:**  
Heart failure: MI, Cardiomyopathy, Myocardial contusion, Ruptured ventricular / septum / valve / toxins.
- **Distributive Shock:**  
Sepsis  
Anaphylactic  
Neurogenic: Hallmark is warm, dry, pink skin with normal capillary refill time and typically alert.  
Toxins
- **Obstructive Shock:**  
Pericardial tamponade. Pulmonary embolus. Tension pneumothorax.  
Signs may include hypotension with distended neck veins, tachycardia, unilateral decreased breath sounds or muffled heart sounds.
- **Acute Adrenal Insufficiency or Congenital Adrenal Hyperplasia:**  
Body cannot produce enough steroids (glucocorticoids / mineralocorticoids.) May have primary or secondary adrenal disease, congenital adrenal hyperplasia, or more commonly have stopped a steroid like prednisone. Injury or illness may precipitate. Usually hypotensive with nausea, vomiting, dehydration and / or abdominal pain. **If suspected Paramedic should give Methylprednisolone 125 mg IM / IV / IO or Dexamethasone 10 mg IM / IV / IO. Use steroid agent specific to your drug list. May administer prescribed steroid carried by patient IM / IV / IO. Patient may have Hydrocortisone (Cortef or Solu-Cortef). Dose: < 1y.o. give 25 mg, 1-12 y.o. give 50 mg, and > 12 y.o. give 100 mg or dose specified by patient's physician.**

## Disposition:

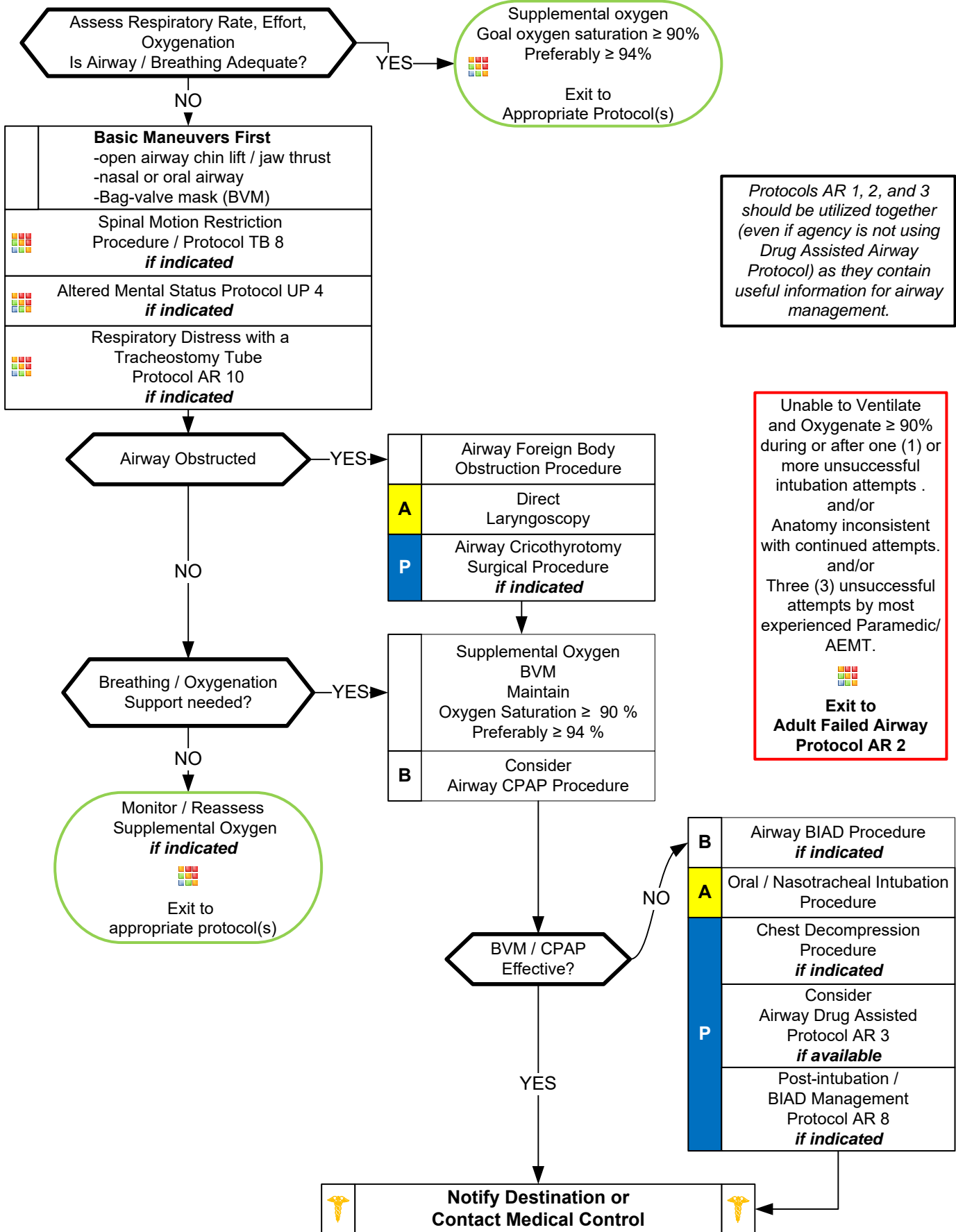
EMS Transport:      ALS:    All patients

# Airway Respiratory





# Adult Airway





# Adult Airway



## Pearls

- See Pearls section of protocols AR 2 and 3.
- For the purposes of this protocol a secure airway is when the patient is receiving appropriate oxygenation and ventilation.
- If an effective airway is being maintained by BVM with continuous pulse oximetry values of  $\geq 90\%$ , it is acceptable to continue with basic airway measures.
- Intubation Attempt is passing the laryngoscope blade past the teeth or ETT inserted into the nasal passage.
- Capnometry or capnography is mandatory with all methods of intubation. Continuous capnography (EtCO<sub>2</sub>) is strongly recommended for the monitoring of all patients with a BIAD and mandatory with monitoring of an endotracheal tube.
- Ventilatory rate should be 8-10 per minute to maintain a EtCO<sub>2</sub> of 35-45. Avoid hyperventilation.
- Anticipating the Difficult Airway and Airway Assessment
  - Difficult BVM Ventilation (MOANS):** Mask seal difficulty (hair, secretions, trauma); Obese, obstruction, OB – 2d and 3rd trimesters; Age  $\geq 55$ ; No teeth; Stiff lungs or neck
  - Difficult Laryngoscopy (LEON):** Look externally for anatomical problems; Evaluate 3-3-2 (Mouth opening should equal 3 of patient's finger's width, mental area to neck should equal 3 of patient's finger's width, base of chin to thyroid prominence should equal 2 of patient's finger's width); Obese, obstruction, OB – 2d and 3d trimesters; Neck mobility limited.
  - Difficulty BIAD (RODS):** Restricted mouth opening; Obese, obstruction, OB – 2d and 3d trimesters; Distorted or disrupted airway; Stiff lungs or neck
  - Difficulty Cricothyrotomy / Surgical Airway (SMART):** Surgery scars; Mass or hematoma, Access or anatomical problems; Radiation treatment to face, neck, or chest; Tumor.
- It is strongly encouraged to complete an Airway Evaluation Form with any BIAD or Intubation procedure.
- Nasotracheal intubation: Procedure requires spontaneous breathing and may require considerable time, exposing patient to critical desaturation. Contraindicated in combative, anatomical disrupted or distorted airways, increased ICP, severe facial trauma, basal skull fracture, and head injury. Orotracheal route is preferred.
- Maintain spinal motion restriction for patients with suspected spinal injury.
- AEMT and Paramedics should consider using a BIAD if oral-tracheal intubation is unsuccessful.
- During intubation attempts use External Laryngeal Manipulation to improve view of glottis.
- Gastric tube placement should be considered in all intubated patients if available or time allows.
- It is important to secure the endotracheal tube well to better maintain ETT placement. Manual stabilization of endotracheal tube should be used during all patient moves / transfers.
- **DOPE:** Displaced tracheostomy tube / ETT, Obstructed tracheostomy tube / ETT, Pneumothorax and Equipment failure.



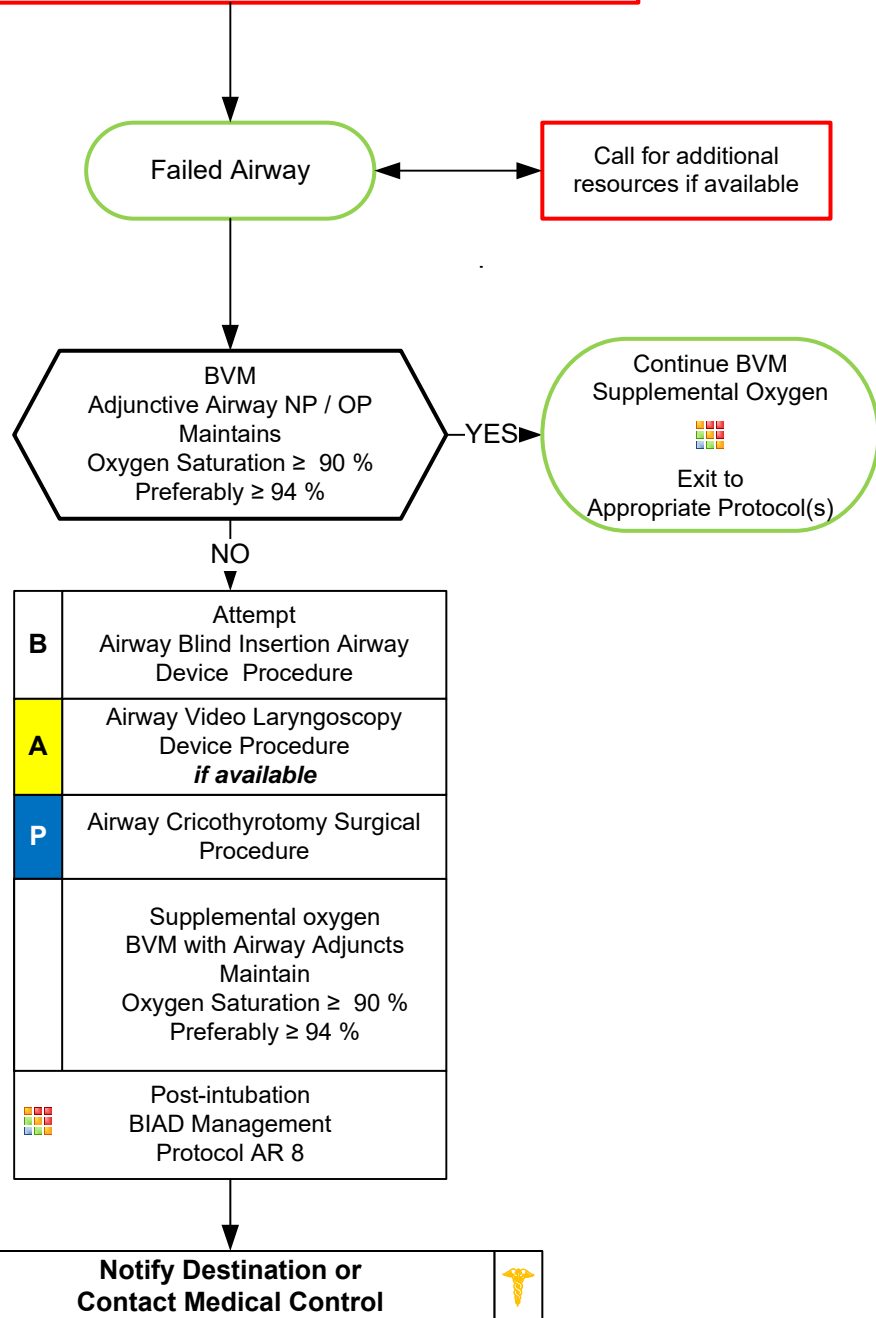
# Adult, Failed Airway



Protocols AR 1, 2, and 3 should be utilized together (even if agency is not using Drug Assisted Airway as they contain useful information for airway management.

Unable to Ventilate and Oxygenate  $\geq 90\%$  during or after one (1) or more unsuccessful intubation attempts.  
and/or  
Anatomy inconsistent with continued attempts.  
and/or  
Three (3) unsuccessful attempts by most experienced Paramedic/AEMT.  
*Each attempt should include change in approach or equipment*

NO MORE THAN THREE (3) ATTEMPTS TOTAL





# Adult, Failed Airway



## Pearls

- For the purposes of this protocol a secure airway is when the patient is receiving appropriate oxygenation and ventilation.
- If an effective airway is being maintained by BVM with continuous pulse oximetry values of  $\geq 90\%$ , it is acceptable to continue with basic airway measures.
- Anticipating the Difficult Airway and Airway Assessment
  - Difficult BVM Ventilation (MOANS):** Mask seal difficulty (hair, secretions, trauma); Obese, obstruction, OB – 2d and 3<sup>rd</sup> trimesters; Age  $\geq 55$ ; No teeth; Stiff lungs or neck
  - Difficult Laryngoscopy (LEON):** Look externally for anatomical problems; Evaluate 3-3-2 (Mouth opening should equal 3 of patient's finger's width, mental area to neck should equal 3 of patient's finger's width, base of chin to thyroid prominence should equal 2 of patient's finger's width); Obese, obstruction, OB – 2d and 3d trimesters; Neck mobility limited.
  - Difficulty BIAD (RODS):** Restricted mouth opening; Obese, obstruction, OB – 2d and 3d trimesters; Distorted or disrupted airway; Stiff lungs or neck
  - Difficulty Cricothyrotomy / Surgical Airway (SMART):** Surgery scars; Mass or hematoma, Access or anatomical problems; Radiation treatment to face, neck, or chest; Tumor.
- If first intubation attempt fails, make an adjustment and then consider:
  - Different laryngoscope blade / Video or other optical laryngoscopy devices
  - Gum Elastic Bougie
  - Different ETT size
  - Change head positioning
- AEMT and Paramedics should consider using a BIAD if oral-tracheal intubation is unsuccessful.
- During intubation attempts use External Laryngeal Manipulation to improve view of glottis.
- Continuous pulse oximetry should be utilized in all patients with inadequate respiratory function.
- Continuous EtCO<sub>2</sub> should be applied to all patients with respiratory failure or to all patients with advanced airways.
- **Notify Medical Control AS EARLY AS POSSIBLE concerning the patient's difficult / failed airway.**
- **DOPE:** Displaced tracheostomy tube / ETT, Obstructed tracheostomy tube / ETT, Pneumothorax and Equipment failure.





# Adult COPD / Asthma Respiratory Distress



## History

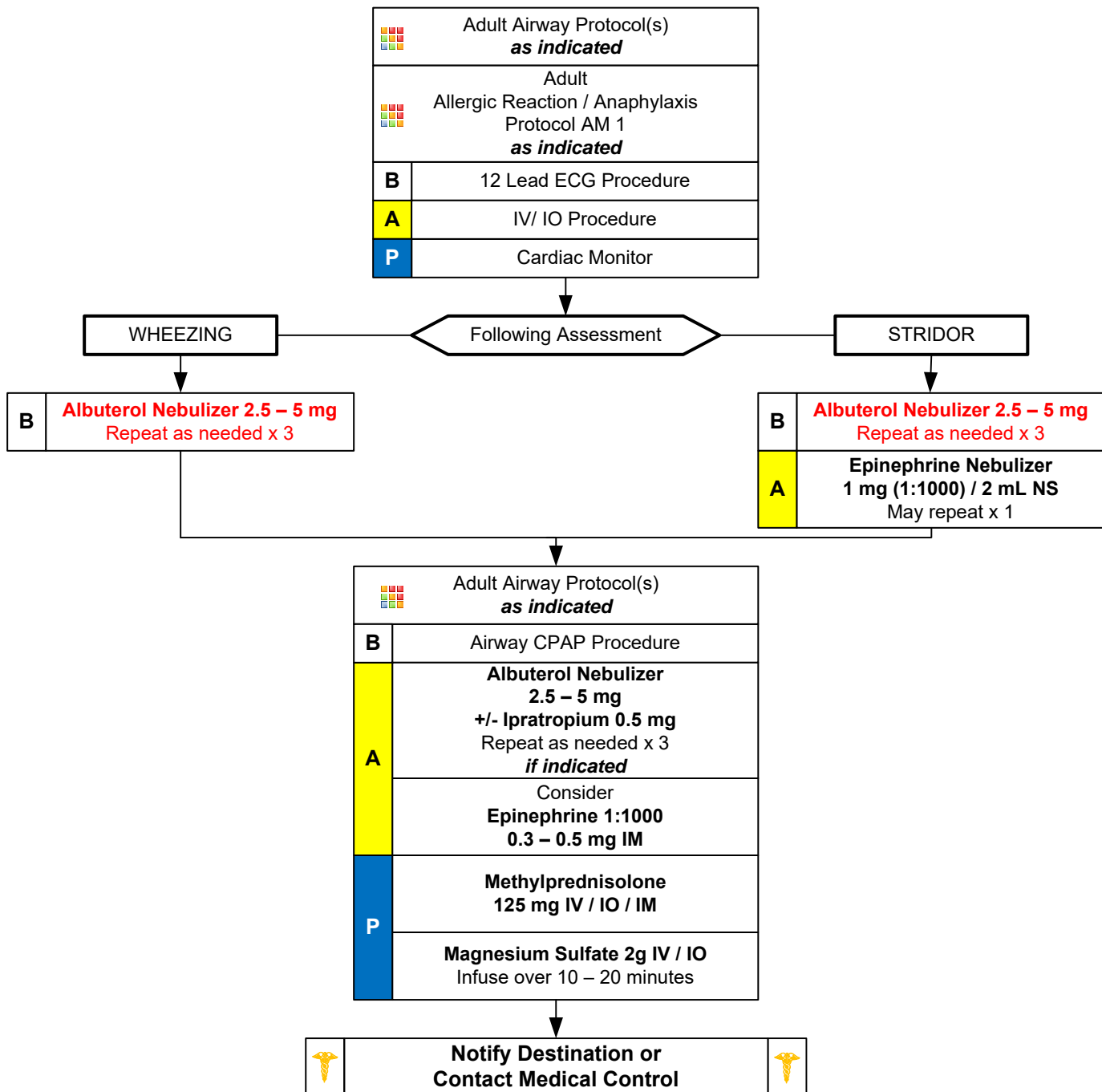
- Asthma; COPD -- chronic bronchitis, emphysema, congestive heart failure
- Home treatment (oxygen, nebulizer)
- Medications (theophylline, steroids, inhalers)
- Toxic exposure, smoke inhalation

## Signs and Symptoms

- Shortness of breath
- Pursed lip breathing
- Decreased ability to speak
- Increased respiratory rate and effort
- Wheezing, rhonchi
- Use of accessory muscles
- Fever, cough
- Tachycardia

## Differential

- Asthma
- Anaphylaxis
- Aspiration
- COPD (Emphysema, Bronchitis)
- Pleural effusion
- Pneumonia
- Pulmonary embolus
- Pneumothorax
- Cardiac (MI or CHF)
- Pericardial tamponade
- Hyperventilation
- Inhaled toxin (Carbon monoxide, etc.)



Airway Respiratory Protocol Section



# Adult COPD / Asthma Respiratory Distress



## Pearls

- **Recommended Exam: Mental Status, HEENT, Skin, Neck, Heart, Lungs, Abdomen, Extremities, Neuro**
- **Items in Red Text are key performance measures used to evaluate protocol compliance and care.**
- **This protocol includes all patients with respiratory distress, COPD, Asthma, Reactive Airway Disease, or Bronchospasm. Patients may also have wheezing and respiratory distress with viral upper respiratory tract infections and pneumonia.**
- **Combination nebulizers containing albuterol and ipratropium:**
  - Patients may receive more than 3 nebulizer treatments, treatments should continue until improvement.
  - Following 3 combination nebulizers, it is acceptable to continue albuterol solely with subsequent treatments as there is no proven benefit to continual use of ipratropium.
- **Epinephrine:**
  - If allergic reaction or anaphylaxis is suspected, give immediately and repeat until improvement.
  - If allergic reaction is not suspected, administer with impending respiratory failure and no improvement.
- **Consider Magnesium Sulfate with impending respiratory failure and no improvement.**
- **Pulse oximetry should be monitored continuously and consider End-tidal CO2 monitoring if available.**
- **CPAP or Non-Invasive Positive Pressure Ventilation:**
  - May be used with COPD, Asthma, Allergic reactions, and CHF.
  - Consider early in treatment course.
  - Consider removal if SBP remains < 100 mmHg and not responding to other treatments.
- **A silent chest in respiratory distress is a pre-respiratory arrest sign.**
- **EMT may administer Albuterol if patient already prescribed and may administer from EMS supply.**
  - Agency Medical Director may require contact of medical control prior to EMT / EMR administering any medication.

## Disposition: EMS Transport:

**ALS:** With a Hx of respiratory distress

Any patient with stridor and all patients other than below

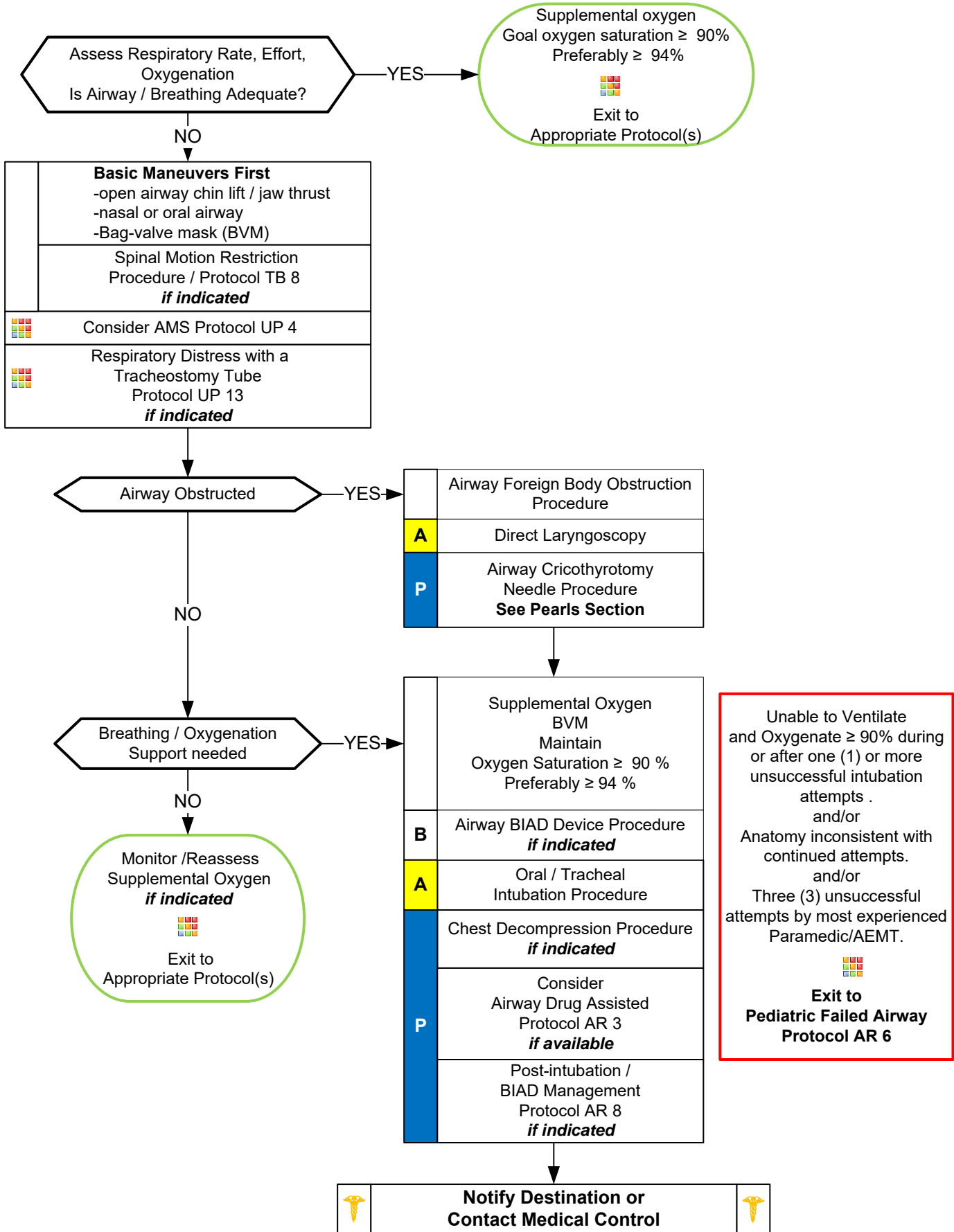
**BLS:** Pulse oximetry > 94%, speaking comfortably post Albuterol, and no retractions

## MD Within 4 Hours:

Asymptomatic post Albuterol, history of respiratory disease AND there is a responsible adult present who will stay with the patient.



# Pediatric Airway





# Pediatric Airway



## Pearls

- For this protocol, pediatric is defined as any patient which can be measured within the Broselow-Luten tape.
- If an effective airway is being maintained by BVM with continuous pulse oximetry values of  $\geq 90\%$ , it is acceptable to continue with basic airway measures.
- For the purposes of this protocol a secure airway is when the patient is receiving appropriate oxygenation and ventilation.
- An intubation attempt is defined as passing the laryngoscope blade or endotracheal tube past the teeth or inserted into the nasal passage.
- Capnometry (color) or capnography is mandatory with all methods of intubation. Document results.
- Continuous capnography (EtCO<sub>2</sub>) is strongly recommended with BIAD or endotracheal tube use though this is not validated and may prove impossible in the neonatal population (verification by two (2) other means is recommended).
- Ventilatory rate: 30 for Neonates, 25 for Toddlers, 20 for School Age, and for Adolescents the normal Adult rate of 8 - 10 per minute. Maintain a EtCO<sub>2</sub> between 35 and 45 and avoid hyperventilation.
- Ketamine may be used during airway management of patients who FIT on the Broselow-Luten Tape with a DIRECT, ONLINE MEDICAL ORDER, by the system MEDICAL DIRECTOR OR ASSISTANT MEDICAL DIRECTOR ONLY. Specific use in this population of patients must also be for use in individual agencies by the NC OEMS State Medical Director prior to use.
- Agencies utilizing Ketamine must submit a local systems plan to State Medical Director detailing how the drug is used in your program.  
Ketamine may be used with and without a paralytic agent in conjunction with either a OP, NP, BIAD or endotracheal tube.  
Ketamine may be used during the resuscitation of hypoxia or hypotension in conjunction with airway management.  
Ketamine may be used in the dangerously combative patient requiring airway management IM. IV / IO should be established as soon as possible.  
Ketamine may NOT be used for purposes of sedation only – it must be used only during airway management procedures.
- It is strongly encouraged to complete an Airway Evaluation Form with any BIAD or Intubation procedure.
- AEMT and Paramedics should consider using a BIAD if oral-tracheal intubation is unsuccessful.
- During intubation attempts use External Laryngeal Manipulation to improve view of glottis.
- Gastric tube placement should be considered in all intubated patients.
- It is important to secure the endotracheal tube well and consider c-collar (even in absence of trauma) to better maintain ETT placement. Manual stabilization of endotracheal tube should be used during all patient moves / transfers.
- Airway Cricothyrotomy Needle Procedure:  
Indicated as a lifesaving / last resort procedure in pediatric patients  $\leq 11$  years of age.  
Very little evidence to support it's use and safety.  
A variety of alternative pediatric airway devices now available make the use of this procedure rare.  
Agencies who utilize this procedure must develop a written procedure, establish a training program, maintain equipment and submit procedure and training plan to the State Medical Director / Regional EMS Office.
- **DOPE:** Displaced tracheostomy tube / ETT, Obstructed tracheostomy tube / ETT, Pneumothorax and Equipment failure.



# Pediatric Failed Airway



Unable to Ventilate and Oxygenate  $\geq 90\%$  during  
or after one (1) or more unsuccessful intubation attempts.  
and/or  
Anatomy inconsistent with continued attempts.  
and/or  
Three (3) unsuccessful attempts by most experienced Paramedic / AEMT.  
*Each attempt should include change in approach  
or equipment*

NO MORE THAN THREE (3) ATTEMPTS TOTAL

Call for additional  
resources if available

Failed Airway

BVM  
Adjunctive Airway NP / OP  
Maintains Oxygen Saturation  
 $\geq 90\%$   
Preferably  $\geq 94\%$

Continue BVM  
Supplemental Oxygen



Exit to  
Appropriate  
Protocol(s)

NO

**A** Airway Video Laryngoscopy  
Device Procedure  
*if available*

**B** Attempt  
Airway Blind Insertion Airway  
Device Procedure

**P** Airway Cricothyrotomy  
Needle Procedure  
**See Pearls Section**

BIAD / Cricothyrotomy  
Successful  
Or  
Oxygenation / Ventilation  
Adequate

YES

Exit to  
Post-intubation /  
BIAD Management  
Protocol AR 8



NO

Supplemental oxygen  
BVM with Airway Adjuncts  
Maintain Oxygen Saturation  
 $\geq 90\%$   
Preferably  $\geq 94\%$

**Notify Destination or  
Contact Medical Control**

Airway Respiratory Protocol Section



# Pediatric Failed Airway



## Pearls

- For this protocol, pediatric is defined as any patient which can be measured within a Length-based Resuscitation Tape.
- If an effective airway is being maintained by BVM with continuous pulse oximetry values of  $\geq 90\%$ , it is acceptable to continue with basic airway measures instead of using a BIAD or Intubation.
- For the purposes of this protocol a secure airway is when the patient is receiving appropriate oxygenation and ventilation.
- An intubation attempt is defined as passing the laryngoscope blade or endotracheal tube past the teeth or inserted into the nasal passage.
- Capnometry (color) or capnography is mandatory with all methods of intubation. Document results.
- Continuous capnography (EtCO<sub>2</sub>) is strongly recommended with BIAD or endotracheal tube use though this is not validated and may prove impossible in the neonatal population (verification by two (2) other means is recommended).
- Ventilatory rate: 30 for Neonates, 25 for Toddlers, 20 for School Age, and for Adolescents the normal Adult rate of 8 – 10 per minute. Maintain a EtCO<sub>2</sub> between 35 and 45 and avoid hyperventilation.
- It is strongly encouraged to complete an Airway Evaluation Form with any BIAD or Intubation procedure.
- If first intubation attempt fails, make an adjustment and then try again: Different laryngoscope blade; Gum Elastic Bougie; Different ETT size; Change cricoid pressure; Apply BURP; Change head positioning
- AEMT and Paramedics should consider using a BIAD if oral-tracheal intubation is unsuccessful.
- During intubation attempts use External Laryngeal Manipulation to improve view of glottis.
- Gastric tube placement should be considered in all intubated patients.
- It is important to secure the endotracheal tube well and consider c-collar (even in absence of trauma) to better maintain ETT placement. Manual stabilization of endotracheal tube should be used during all patient moves / transfers.
- **Airway Cricothyrotomy Needle Procedure:**  
Indicated as a lifesaving / last resort procedure in pediatric patients  $\leq 11$  years of age.  
Very little evidence to support it's use and safety.  
A variety of alternative pediatric airway devices now available make the use of this procedure rare.  
Agencies who utilize this procedure must develop a written procedure, establish a training program, maintain equipment and submit procedure and training plan to the State Medical Director / Regional EMS Office.
- **DOPE:** Displaced tracheostomy tube / ETT, Obstructed tracheostomy tube / ETT, Pneumothorax and Equipment failure.



# Pediatric Asthma Respiratory Distress



## History

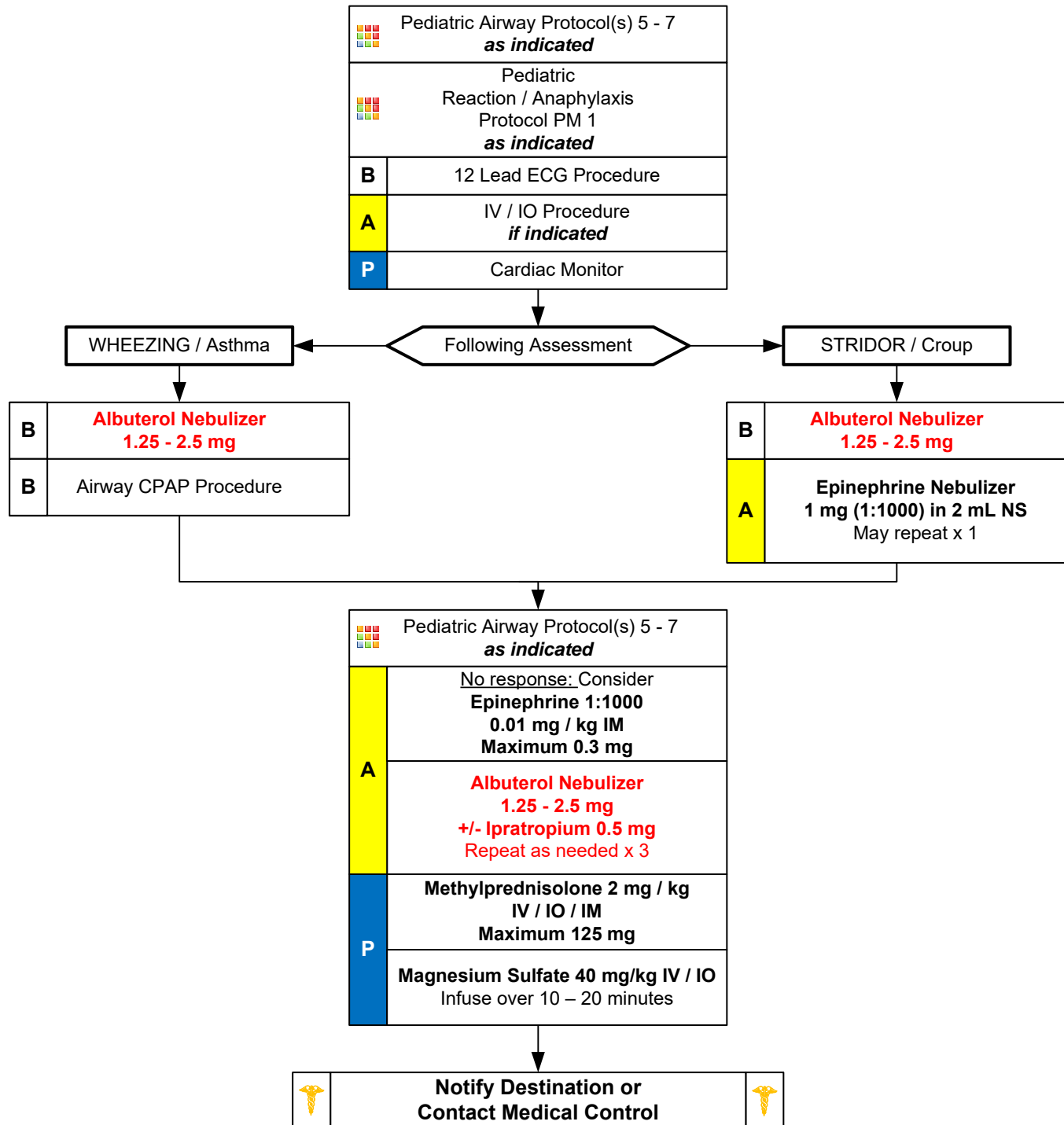
- Time of onset
- Possibility of foreign body
- Past Medical History
- Medications
- Fever / Illness
- Sick Contacts
- History of trauma
- History / possibility of choking
- Ingestion / OD
- Congenital heart disease

## Signs and Symptoms

- Wheezing / Stridor / Crackles / Rales
- Nasal Flaring / Retractions / Grunting
- Increased Heart Rate
- AMS
- Anxiety
- Attentiveness / Distractability
- Cyanosis
- Poor feeding
- JVD / Frothy Sputum
- Hypotension

## Differential

- Asthma / Reactive Airway Disease
- Aspiration
- Foreign body
- Upper or lower airway infection
- Congenital heart disease
- OD / Toxic ingestion / CHF
- Anaphylaxis
- Trauma





# Pediatric Asthma Respiratory Distress

## Pearls

- **Recommended Exam: Mental Status, HEENT, Skin, Neck, Heart, Lungs, Abdomen, Extremities, Neuro**
- **Items in Red Text are key performance measures used to evaluate protocol compliance and care.**
- **Pulse oximetry should be monitored continuously in the patient with respiratory distress.**
- **This protocol includes all patients with respiratory distress, Asthma, Reactive Airway Disease, croup, or Bronchospasm. Patients may also have wheezing and respiratory distress with viral upper respiratory tract infections and pneumonia.**
- **Combination nebulizers containing albuterol and ipratropium:**
  - Patients may receive more than 3 nebulizer treatments, treatments should continue until improvement.
  - Following 3 combination nebulizers, it is acceptable to continue albuterol solely with subsequent treatments as there is no proven benefit to continual use of ipratropium.
- **Epinephrine:**
  - If allergic reaction or anaphylaxis is suspected, give immediately and repeat until improvement.
  - If allergic reaction is not suspected, administer with impending respiratory failure and no improvement.
- **Consider Magnesium Sulfate with impending respiratory failure and no improvement.**
- **Albuterol dosing:  $\leq 1$  year of age 1.25 mg; 1 – 6 years 1.25 – 2.5 mg; 6 – 14 years 2.5 mg;  $\geq 15$  years 2.5 – 5 mg.**
- **Consider IV access when Pulse oximetry remains  $\leq 92\%$  after first beta agonist treatment.**
- **Do not force a child into a position, allow them to assume position of comfort. They will protect their airway by their body position.**
- **Bronchiolitis is a viral infection typically affecting infants which results in wheezing which may not respond to beta-agonists. Consider Epinephrine nebulizer if patient  $< 18$  months and not responding to initial beta-agonist treatment.**
- **Croup typically affects children  $< 2$  years of age. It is viral, possible fever, gradual onset, no drooling is noted.**
- **Epiglottitis typically affects children  $> 2$  years of age. It is bacterial, with fever, rapid onset, possible stridor, patient wants to sit up to keep airway open, drooling is common. Airway manipulation may worsen the condition.**
- **In patients using levalbuterol (Xopenex) you may use Albuterol for the first treatment then use the patient's supply for repeat nebulizers or agency's supply.**
- **EMT may administer Albuterol if patient already prescribed and may administer from EMS supply.**
  - Agency medical director may require Contact of Medical Control prior to administration.

**Disposition:** EMS Transport:

**ALS:** With a Hx of respiratory distress

Any patient with stridor and all patients other than below

**BLS:** Pulse oximetry  $> 94\%$ , speaking comfortably post Albuterol, and no retractions

**MD Within 4 Hours:** Asymptomatic post Albuterol, history of respiratory disease AND there is a responsible parent present who will stay with the patient.

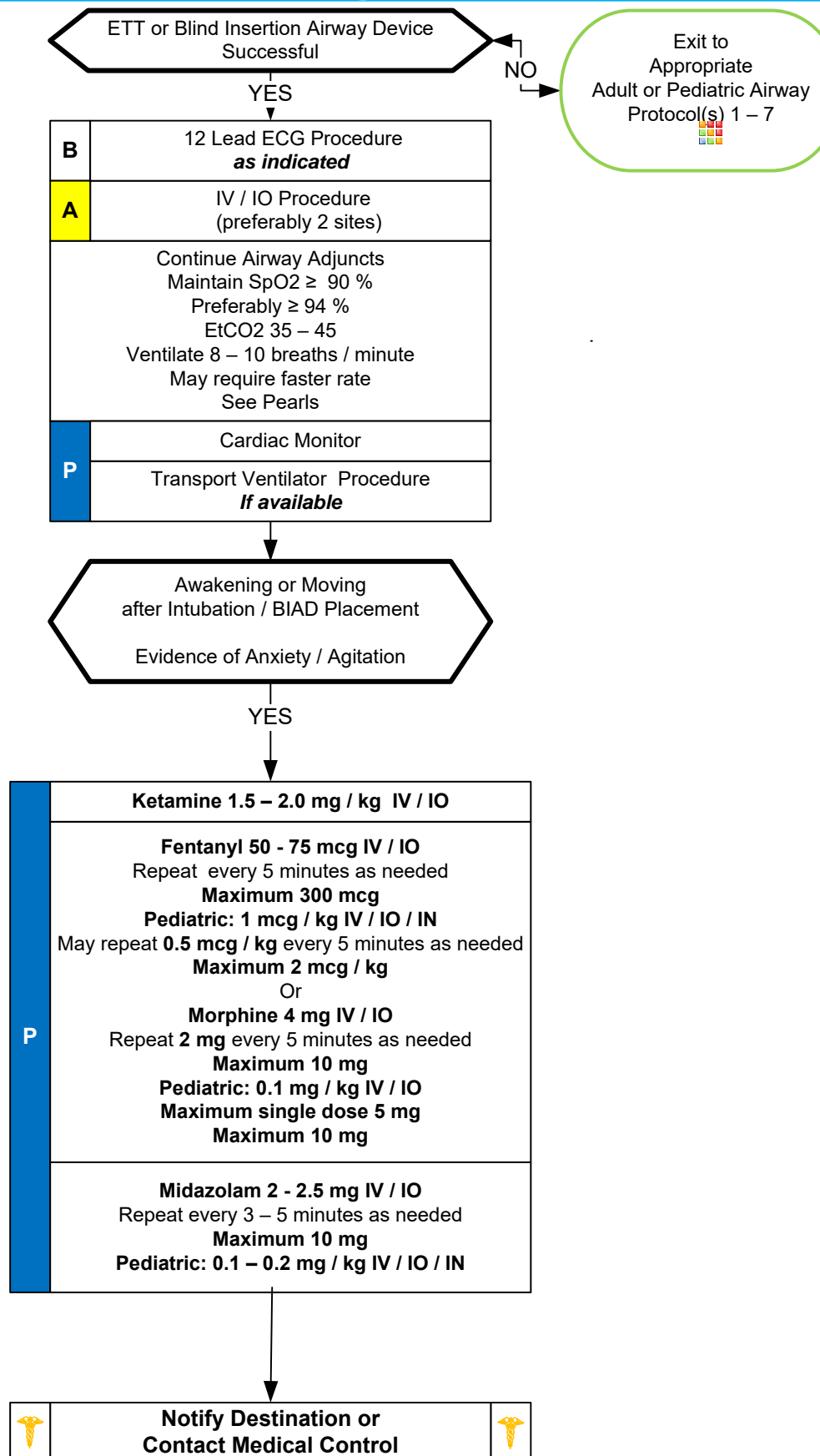




# Post-intubation / BIAD Management



Protocols AR 1, 2, 3, 5, and 6 should be utilized together (even if agency is not using Drug Assisted Airway Protocol) as they contain useful information for airway management.





# Post-intubation / BIAD Management



## Pearls

- **Recommended Exam: Mental Status, HEENT, Heart, Lungs, Neuro**
- **Patients requiring advanced airways and ventilation commonly experience pain and anxiety.**
- **Unrelieved pain can lead to increased catecholamine release, ischemia, immunosuppression, and prolonged hospitalization.**
- **Ventilated patients cannot communicate pain / anxiety and providers are poor at recognizing pain / anxiety.**
- **Vital signs such as tachycardia and / or hypertension can provide clues to inadequate sedation, however they both are not always reliable indicators of patient's lack of adequate sedation.**
- **Pain must be addressed first, before anxiety. Opioids are typically the first line agents before benzodiazepines. Ketamine is also a reasonable first choice agent.**
- **Ventilator / Ventilation strategies will need to be tailored to individual patient presentations. Medical director can indicate different strategies above.**
- In general ventilation with BVM should cause chest rise. With mechanical ventilation a reasonable tidal volume should be about 6 mL/kg and peak pressures should be < 30 cmH<sub>2</sub>O.
- Continuous pulse oximetry and capnography should be maintained during transport for monitoring.
- Head of bed should be maintained at least 10 – 20 degrees of elevation when possible to decrease aspiration risk.
- With abrupt clinical deterioration, if mechanically ventilated, disconnect from ventilator to assess lung compliance. Search for dislodged ETT or BIAD, obstruction in tubing or airway, pneumothorax, or ETT balloon leak.
- **DOPE: Displaced tracheostomy tube / ETT, Obstructed tracheostomy tube / ETT, Pneumothorax and Equipment failure.**



# Ventilator Emergencies



## History

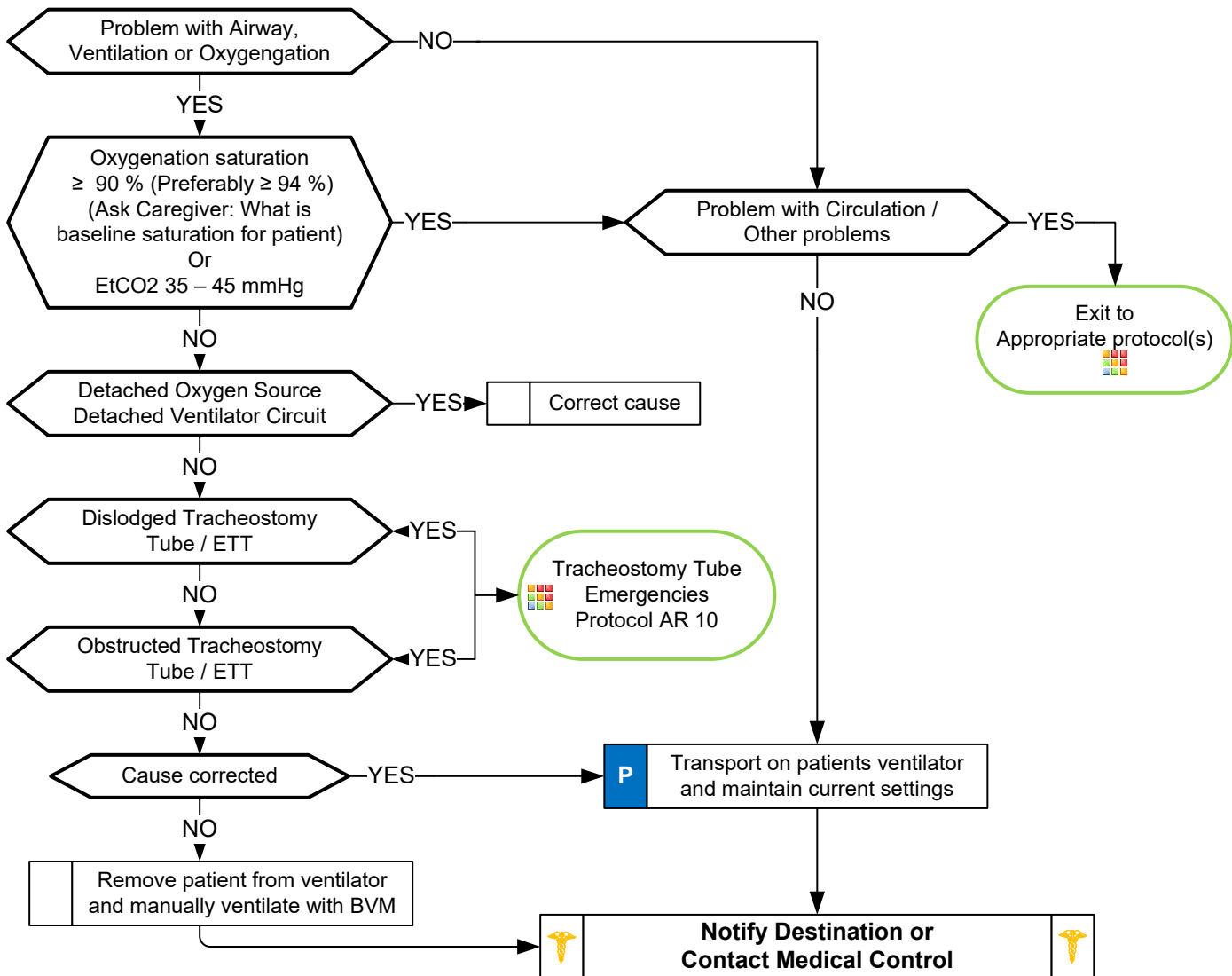
- Birth defect (tracheal atresia, tracheomalacia, craniofacial abnormalities)
- Surgical complications (damage to phrenic nerve)
- Trauma (post-traumatic brain or spinal cord injury)
- Medical condition (bronchopulmonary dysplasia, muscular dystrophy)

## Signs and Symptoms

- Transport requiring maintenance of a mechanical ventilator
- Power or equipment failure at residence

## Differential

- Disruption of oxygen source
- Dislodged or obstructed tracheostomy tube
- Detached or disrupted ventilator circuit
- Cardiac arrest
- Increased oxygen requirement / demand
- Ventilator failure



Airway Respiratory Protocol Section

## Pearls

- **Always talk to family / caregivers as they have specific knowledge and skills.**
- **If using the patient's ventilator bring caregiver knowledgeable in ventilator operation during transport.**
- Always use patient's equipment if available and functioning properly.
- Continuous pulse oximetry and end tidal CO<sub>2</sub> monitoring must be utilized during assessment and transport.
- Unable to correct ventilator problem: Remove patient from ventilator and manually ventilate using BVM. Take patient's ventilator to hospital even if not functioning properly.
- Typical alarms:
  - Low Pressure / Apnea: Loose or disconnected circuit, leak in circuit or around tracheostomy site.
  - Low Power: Internal battery depleted.
  - High Pressure: Plugged / obstructed airway or circuit.
- **DOPE:** Displaced tracheostomy tube / ETT, **O**bststructed tracheostomy tube / ETT, **P**neumothorax and **E**quipment failure.

**Disposition:** EMS Transport: ALS: All patients

AR 8

Any local EMS System changes to this document must follow the NC OEMS Protocol Change Policy and be approved by OEMS

## History

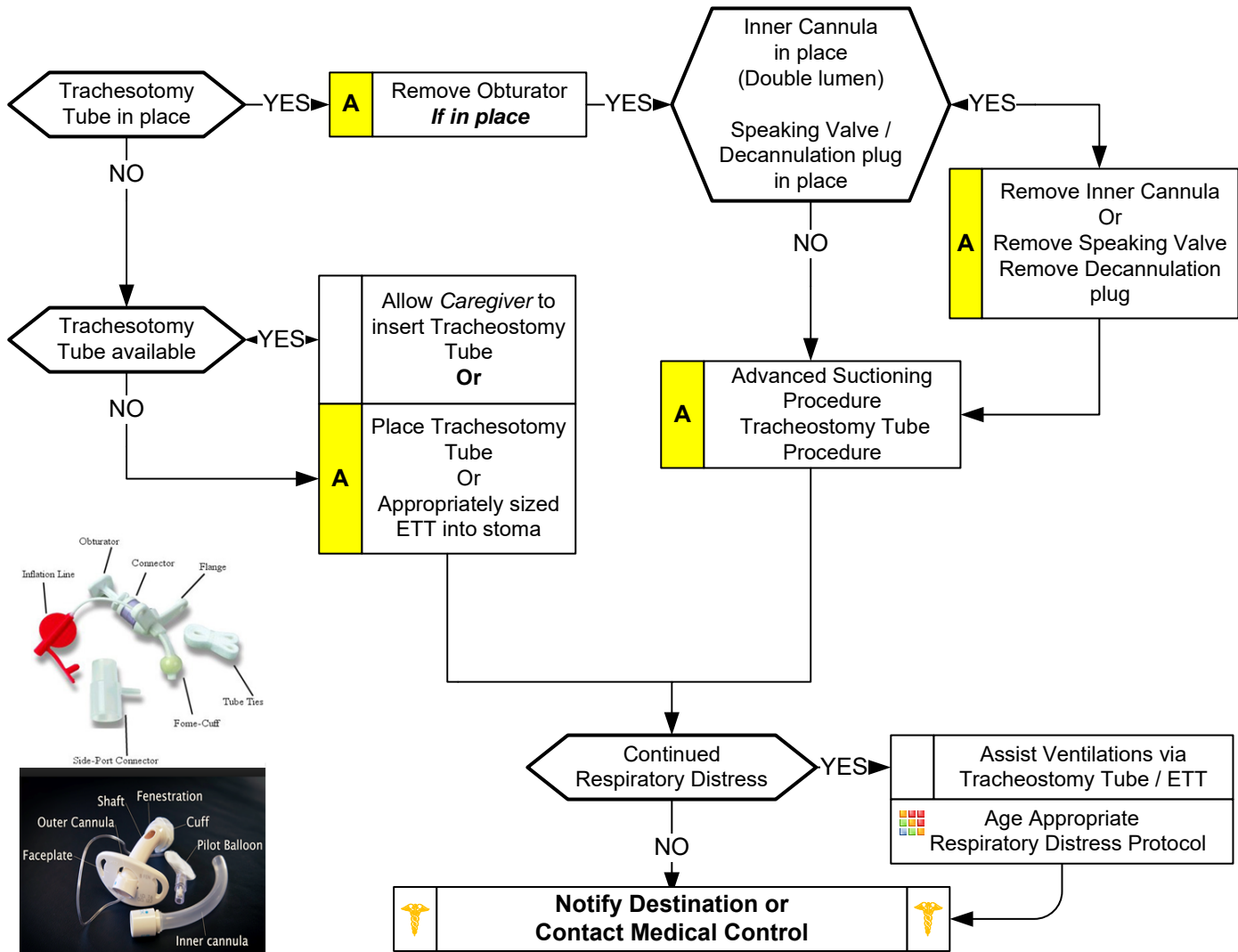
- Birth defect (tracheal atresia, tracheomalacia, craniofacial abnormalities)
- Surgical complications (accidental damage to phrenic nerve)
- Trauma (post-traumatic brain or spinal cord injury)
- Medical condition (bronchial or pulmonary dysplasia, muscular dystrophy)

## Signs and Symptoms

- Nasal flaring
- Chest wall retractions (with or without abnormal breath sounds)
- Attempts to cough
- Copious secretions noted coming out of the tube
- Faint breath sounds on both sides of chest despite significant respiratory effort
- AMS
- Cyanosis

## Differential

- Allergic reaction
- Asthma
- Aspiration
- Septicemia
- Foreign body
- Infection
- Congenital heart disease
- Medication or toxin
- Trauma



## Pearls

- **Always talk to family / caregivers as they have specific knowledge and skills.**
- **Important to ask if patient has undergone laryngectomy. This does not allow mouth/nasal ventilation by covering stoma.**
- Use patients equipment if available and functioning properly.
- Estimate suction catheter size by doubling the inner tracheostomy tube diameter and rounding down.
- Suction depth: Ask family / caregiver. No more than 3 to 6 cm typically. Instill 2 – 3 mL of NS before suctioning.
- Do not suction more than 10 seconds each attempt and pre-oxygenate before and between attempts.
- DO NOT force suction catheter. If unable to pass, then tracheostomy tube should be changed.
- Always deflate tracheal tube cuff before removal. Continual pulse oximetry and EtCO<sub>2</sub> monitoring if available.
- **DOPE:** Displaced tracheostomy tube / ETT, **O**bststructed tracheostomy tube / ETT, **P**neumothorax and **E**quipment failure.

**Disposition:** EMS Transport: ALS: All patients

# Adult Trauma





# Blast Injury / Incident



## History

- Type of exposure (heat, gas, chemical)
- Inhalation injury
- Time of Injury
- Past medical history / Medications
- Other trauma
- Loss of Consciousness
- Tetanus/Immunization status

## Signs and Symptoms

- Burns, pain, swelling
- Dizziness
- Loss of consciousness
- Hypotension/shock
- Airway compromise/distress could be indicated by hoarseness/ wheezing / Hypotension

## Differential

- Superficial (1<sup>st</sup> Degree) red – painful (Don't include in TBSA)
- Partial Thickness (2<sup>nd</sup> Degree) blistering
- Full Thickness (3<sup>rd</sup> Degree) painless/ charred or leathery skin
- Thermal injury
- Chemical – Electrical injury
- Radiation injury
- Blast injury

**Nature of Device:** Agent / Amount. Industrial Explosion. Terrorist Incident. Improvised Explosive Device.

**Method of Delivery:** Incendiary / Explosive

**Nature of Environment:** Open / Closed.

**Distance from Device:** Intervening protective barrier. Other environmental hazards,

**Evaluate for:** Blunt Trauma / Crush Injury / Compartment Syndrome / Traumatic Brain Injury / Concussion / Tympanic Membrane Rupture / Abdominal hemorrhage or Evisceration, Blast Lung Injury and Penetrating Trauma.

## Scene Safety / Quantify and Triage Patients / Load and Go with Assessment / Treatment Enroute

Accidental / Intentional Explosions  
(See Pearls)

	Triage Protocol UP 2 <b>as indicated</b>
	Age Appropriate Airway Protocol(s) AR 1, 2, 3, 5, 6 <b>as indicated</b>
	Multiple Trauma Protocol TB 6 <b>if indicated</b>
<b>A</b>	IV / IO Procedure <b>if indicated</b>
<b>P</b>	Cardiac Monitor <b>if indicated</b>
	Thermal Burn Protocol TB 9 Chemical and Electrical Burn Protocol TB 2 <b>if indicated</b>
	Crush Injury Protocol TB 3 <b>if indicated</b>
	Radiation Incident Protocol TB 7 <b>if indicated</b>

Blast Lung Injury

YES

Age Appropriate  
Airway Protocol(s) AR 4, 7  
**as indicated**

NO

	Decontamination Procedure <b>if indicated</b>
	Pain Control Protocol UP 11 <b>if indicated</b>
Rapid Transport to appropriate destination using <b>Trauma and Burn:</b> <b>EMS Triage and Destination Plan</b>	

	Notify Destination or Contact Medical Control	
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Trauma and Burn Protocol Section





# Blast Injury / Incident



## Pearls

- **Types of Blast Injury:**

Primary Blast Injury: From pressure wave.

Secondary Blast Injury: Impaled objects. Debris which becomes missiles / shrapnel.

Tertiary Blast Injury: Patient falling or being thrown / pinned by debris.

Most Common Cause of Death: Secondary Blast Injuries.

- **Triage of Blast Injury patients:**

Blast Injury Patients with Burn Injuries Must be Triageed using the Thermal / Chemical / Electrical Burn

Destination Guidelines for Critical / Serious / Minor Trauma and Burns

Patients may be hard of hearing due to tympanic membrane rupture.

- **Care of Blast Injury Patients:**

Patients may suffer multi-system injuries including blunt and penetrating trauma, shrapnel, barotrauma, burns, and toxic chemical exposure.

Consider airway burns which should prompt early and aggressive airway management.

Cover open chest wounds with semi-occlusive dressing.

Use Lactated Ringers (if available) for all Critical or Serious Burns.

Minimize IV fluids resuscitation in patients with no sign of shock or poor perfusion.

- **Blast Lung Injury:**

Blast Lung Injury is characterized by respiratory difficulty and hypoxia. Can occur (rarely) in patients without external thoracic trauma. More likely in enclosed space or in close proximity to explosion.

Symptoms: Dyspnea, hemoptysis, cough, chest pain, wheezing and hemodynamic instability.

Signs: Apnea, tachypnea, hypopnea, hypoxia, cyanosis and diminished breath sounds.

Air embolism should be considered and patient transported prone and in slight left-lateral decubitus position.

Blast Lung Injury patients may require early intubation but positive pressure ventilation may exacerbate the injury, avoid hyperventilation.

Air transport may worsen lung injury as well and close observation is mandated. Tension pneumothorax may occur requiring chest decompression. Be judicious with fluids as volume overload may worsen lung injury.

- **Accidental Explosions or Intentional Explosions:**

**All explosions or blasts should be considered intentional until determined otherwise.**

Attempt to determine source of the blast to include any potential threat for aerosolization of hazardous materials. Evaluate scene safety to include the source of the blast that may continue to spill explosive liquids or gases.

Consider structural collapse / Environmental hazards / Fire.

Conditions that led to the initial explosion may be returning and lead to a second explosion.

Greatest concern is potential threat for a secondary device.

Patients who can, typically will attempt to move as far away from the explosive source as they safely can.

Evaluate surroundings for suspicious items; unattended back packs or packages, or unattended vehicles.

**If patient is unconscious or there is(are) fatality(fatalities) and you are evaluating patient(s) for signs of life:**

**Before moving note if there are wires coming from the patient(s), or it appears the patient(s) is(are) lying on a package/package, or bulky item, do not move the patient(s), quickly back away and immediately notify a law enforcement officer.**

If there are no indications the patient is connected to a triggering mechanism for a secondary device, expeditiously remove the patient(s) from the scene and begin transport to the hospital.

Protect the airway and cervical spine, however, beyond the primary survey, care and a more detailed assessment should be deferred until the patient is in the ambulance.

If there are signs the patient was carrying the source of the blast, notify law enforcement immediately and most likely, a law enforcement officer will accompany your patient to the hospital.

## Disposition:

**EMS Transport:**

**ALS:** All patients



# Chemical and Electrical Burn



## History

- Type of exposure (heat, gas, chemical)
- Inhalation injury
- Time of Injury
- Past medical history / Medications
- Other trauma
- Loss of Consciousness
- Tetanus/Immunization status

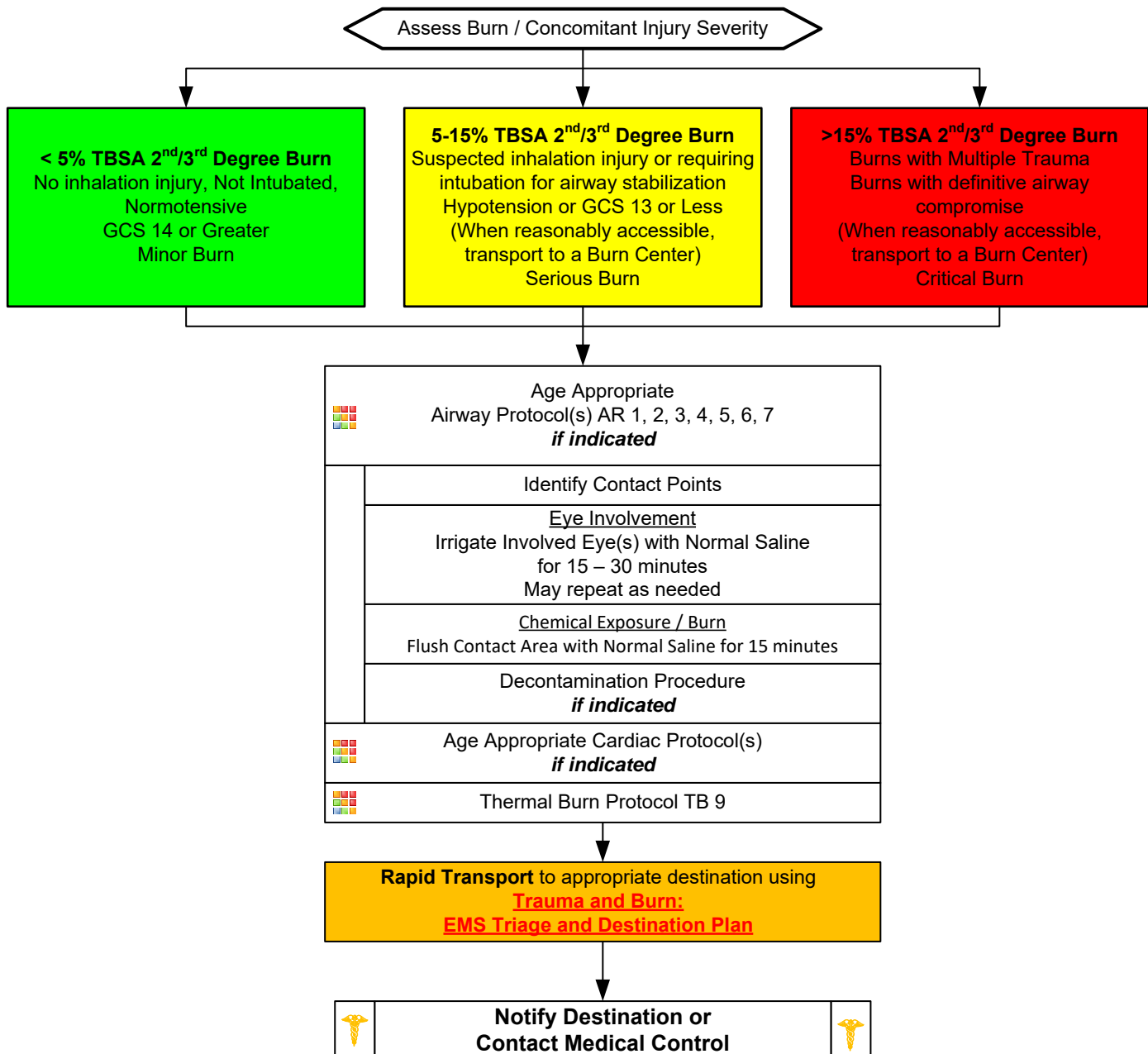
## Signs and Symptoms

- Burns, pain, swelling
- Dizziness
- Loss of consciousness
- Hypotension/shock
- Airway compromise/distress could be indicated by hoarseness/ wheezing / Hypotension

## Differential

- Superficial (1<sup>st</sup> Degree) red - painful (Don't include in TBSA)
- Partial Thickness (2<sup>nd</sup> Degree) blistering
- Full Thickness (3<sup>rd</sup> Degree) painless/ charred or leathery skin
- Thermal injury
- Chemical – Electrical injury
- Radiation injury
- Blast injury

**Assure Chemical Source is NOT Hazardous to Responders.**  
**Assure Electrical Source is NO longer in contact with patient before touching patient.**



Trauma and Burn Protocol Section



# Chemical and Electrical Burn



## Pearls

- **Recommended Exam: Mental Status, HEENT, Neck, Heart, Lungs, Abdomen, Extremities, Back, and Neuro**
- **Green, Yellow and Red In burn severity do not apply to Triage systems.**
- **Refer to Rule of Nines: Remember the extent of the obvious external burn from an electrical source does not always reflect more extensive internal damage not seen.**
- **Chemical Burns:**
  - Refer to Decontamination Procedure.
  - Normal Saline or Sterile Water is preferred, however if not available, do not delay irrigation and use tap water. Other water sources may be used based on availability.
  - Flush the area as soon as possible with the cleanest readily available water or saline solution using copious amounts of fluids.
- **Electrical Burns:**
  - DO NOT contact patient until you are certain the source of the electrical shock is disconnected.
  - Attempt to locate contact points (generally there will be two or more.) A point where the patient contacted the source and a point(s) where the patient is grounded.
  - Sites will generally be full thickness.
  - Do not refer to as entry and exit sites or wounds.**
  - Cardiac Monitor: Anticipate ventricular or atrial irregularity including VT, VF, atrial fibrillation and / or heart blocks.
  - Attempt to identify the nature of the electrical source (AC / DC), the amount of voltage and the amperage the patient may have been exposed to during the electrical shock.

## Disposition:

**EMS Transport:**    **ALS:**    All patients



# Crush Syndrome Trauma



## History

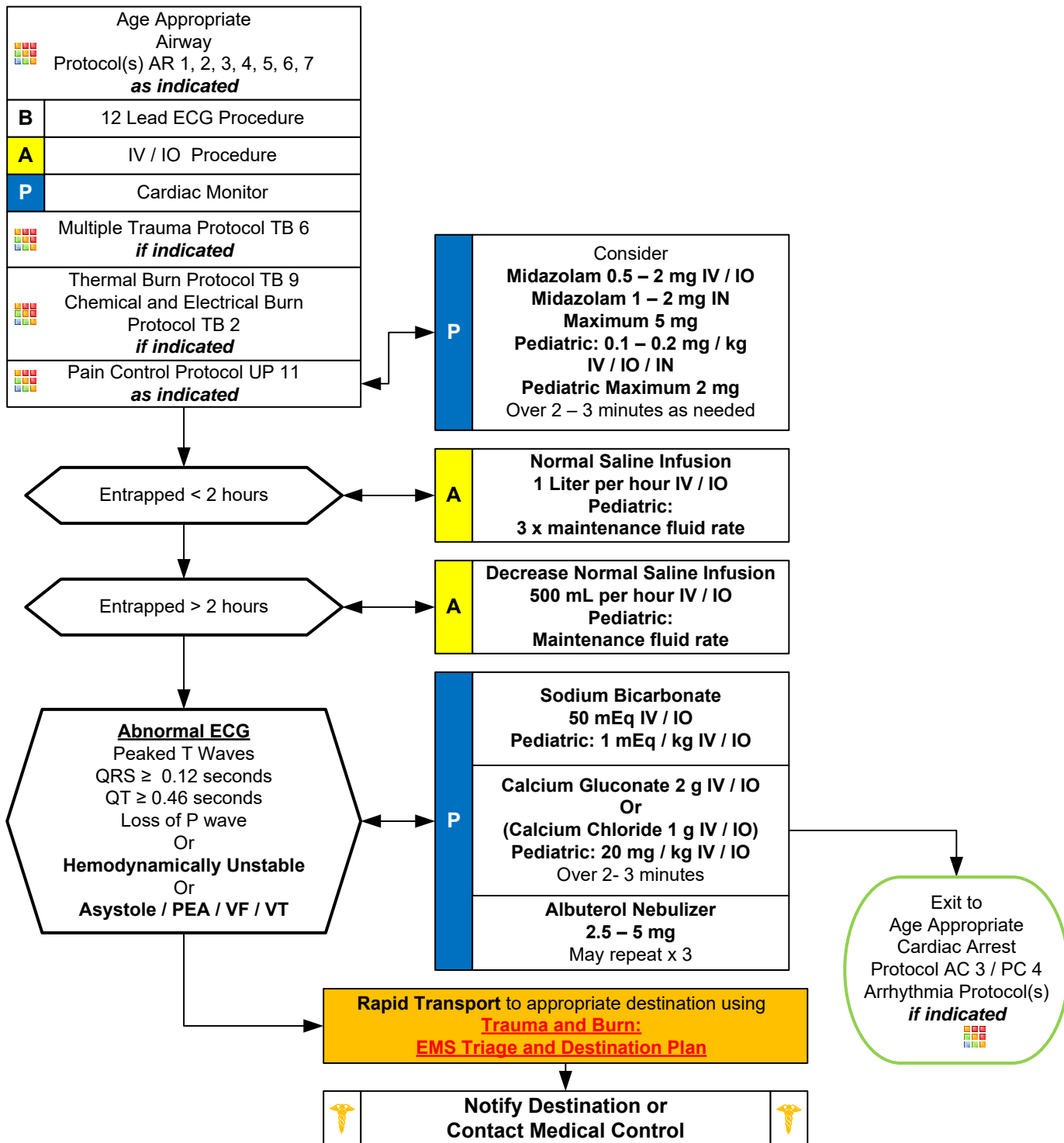
- Entrapped and crushed under heavy load > 30 minutes
- Extremity / body crushed
- Building collapse, trench collapse, industrial accident, pinned under heavy equipment

## Signs and Symptoms

- Hypotension
- Hypothermia
- Abnormal ECG findings
- Pain
- Anxiety

## Differential

- Entrapment without crush syndrome
- Vascular injury with perfusion deficit
- Compartment syndrome
- Altered mental status





# Crush Syndrome Trauma



## Pearls

- **Recommended exam: Mental Status, Musculoskeletal, Neuro**
- **Scene safety is of paramount importance as typical scenes pose hazards to rescuers. Call for appropriate resources.**
- **Lowest blood pressure by age: < 31 days: > 60 mmHg. 31 days to 1 year: > 70 mmHg. Greater than 1 year:  $70 + 2 \times \text{age in years}$ .**
- **Pediatric IV Fluid maintenance rate: 4 mL per first 10 kg of weight + 2 mL per second 10 kg of weight + 1 mL for every additional kg in weight.**
- **Crush syndrome typically manifests after 2 – 4 hours of crush injury, but may present in < 1 hour.**
- **Fluid resuscitation:**
  - If access to patient and initiation of IV fluids occurs after 2 hours, give 2 liters of IV fluids in adults and 20 mL/kg of IV fluids in pediatrics and then begin > 2 hour dosing regimen.**
- **Consider all possible causes of shock and treat per appropriate protocol. Majority of decompensation in pediatrics is airway related.**
- **Decreasing heart rate and hypotension occur late in children and are signs of imminent cardiac arrest.**
- **Shock may be present with a normal blood pressure initially.**
- **Shock often is present with normal vital signs and may develop insidiously. Tachycardia may be the only manifestation.**
- **Consider all possible causes of shock and treat per appropriate protocol.**
- **Patients may become hypothermic even in warm environments.**
- **Hyperkalemia from crush syndrome can produce ECG changes described in protocol, but may also be a bizarre, wide complex rhythm. Wide complex rhythms should also be treated using the VF/Pulseless VT Protocol.**

## Disposition:

**EMS Transport:**    **ALS:**    All patients



# Extremity Trauma



## History

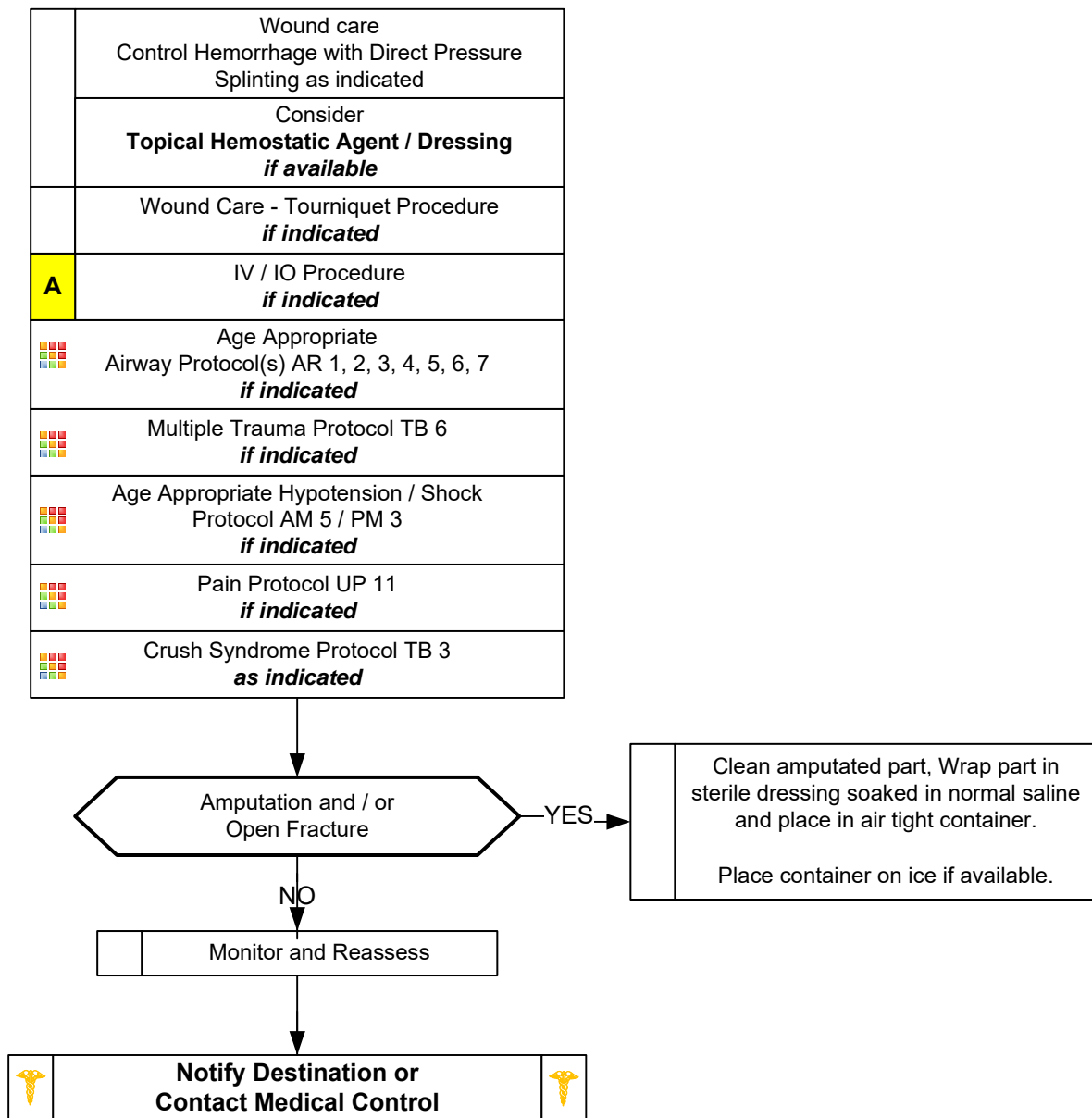
- Type of injury
- Mechanism: crush / penetrating / amputation
- Time of injury
- Open vs. closed wound / fracture
- Wound contamination
- Medical history
- Medications

## Signs and Symptoms

- Pain, swelling
- Deformity
- Altered sensation / motor function
- Diminished pulse / capillary refill
- Decreased extremity temperature

## Differential

- Abrasion
- Contusion
- Laceration
- Sprain
- Dislocation
- Fracture
- Amputation





# Extremity Trauma



## Pearls

- **Recommended Exam: Mental Status, Extremity, Neuro**
- Peripheral neurovascular status is important
- In amputations, time is critical. Transport and notify medical control immediately, so that the appropriate destination can be determined.
- Hip dislocations and knee and elbow fracture / dislocations have a high incidence of vascular compromise.
- Urgently transport any injury with vascular compromise.
- Blood loss may be concealed or not apparent with extremity injuries.
- Lacerations must be evaluated for repair within 6 hours from the time of injury.
- Multiple casualty incident: Tourniquet Procedure may be considered first instead of direct pressure.

## Disposition:

### EMS Transport:

- ALS:** All patients with tourniquets, abnormal vital signs, uncontrolled bleeding, and/or amputation.
- BLS:** Patients with minimal controlled bleeding, normal vitals signs, and no anticoagulant use.



# Head Trauma



## History








- Time of injury
- Mechanism (blunt vs. penetrating)
- Loss of consciousness
- Bleeding
- Past medical history
- Medications
- Evidence for multi-trauma

## Signs and Symptoms


- Pain, swelling, bleeding
- Altered mental status
- Unconscious
- Respiratory distress / failure
- Vomiting
- Major traumatic mechanism of injury
- Seizure

## Differential

- Skull fracture
- Brain injury (Concussion, Contusion, Hemorrhage or Laceration)
- Epidural hematoma
- Subdural hematoma
- Subarachnoid hemorrhage
- Spinal injury
- Abuse

 Age Appropriate Airway Protocol(s) AR 1, 2, 3, 5, 6 <i>if indicated</i>	
	<b>Obtain and Record GCS</b>
	Oxygen Therapy via Non-Rebreather for <b>ALL</b> patients with suspected Head Injury who meet <b>Trauma Destination Criteria</b>
	Maintain EtCO2 35 – 45 mmHg <b>Goal is to maintain 40mmHg</b>
	Blood Glucose Analysis Procedure
<b>A</b>	IV / IO Procedure <i>if indicated</i>
<b>P</b>	Cardiac Monitor
 Altered Mental Status Protocol UP 4 <i>if indicated</i>	
 Multiple Trauma Protocol TB 6 <i>if indicated</i>	
<b>A</b>	 Maintain age appropriate SBP with fluid bolus <b>Adult Goal: SBP &gt;100</b> <b>Ped Goal: SBP &gt;70 + 2x Age in years</b>
 Seizure Protocol UP 13 <i>if indicated</i>	
 Spinal Motion Restriction Procedure / Protocol TB 8 <i>if indicated</i>	
 Pain Control Protocol UP 11 <i>if indicated</i>	
Monitor and Reassess	

**DO NOT  
HYPERVENTILATE**  
 Hyperventilation lowers CO2  
 and causes vasoconstriction  
 leading to decreased  
 cerebral blood flow and leads  
 to poor outcomes.

Age Appropriate  
 Hypotension / Shock  
 Protocol AM 5 / PM 3  
**For persistent Hypotension**

**Rapid Transport** to appropriate destination  
 using  
**Trauma and Burn:**  
**EMS Triage and Destination Plan**



**Notify Destination or  
Contact Medical Control**



Trauma and Burn Protocol Section



Eye Opening Response	Verbal Response	Motor Response
4 = Spontaneous	5 = Oriented	6 = Obeys commands
3 = To verbal stimuli	4 = Confused	5 = Localizes pain
2 = To pain	3 = Inappropriate words	4 = Withdraws from pain
1 = None	2 = Incoherent	3 = Flexion to pain or decorticate
	1 = None	2 = Extension to pain or decerebrate
		1 = None

## Pearls

- **Recommended Exam:** Mental Status, HEENT, Heart, Lungs, Abdomen, Extremities, Back, Neuro
- **GCS is a key performance measure used in the EMS Acute Trauma Care Toolkit.**
- **A single episode of hypoxia, hypotension, or hyperventilation can significantly increase morbidity and mortality in head injury. These are the Three “H bombs” of worsening outcome.**
- **Hyperventilation in head injury:**
  - Hyperventilation lowers CO<sub>2</sub> and causes vasoconstriction leading to decreased cerebral blood flow and leads to poor outcomes.**
  - Hyperventilation can occur with high rate as well as over inflation. Use of flow controlled BVMs and visual ventilatory rate reminders are recommended**
  - Starting ventilatory rates by age (titrate to keep EtCO<sub>2</sub> at 40):**
    - Infants (age 0-24 months): 25 bpm**
    - Children (age 2-14): 20 bpm**
    - Adults (age 15+): 10 bpm**
- **Do not place in Trendelenburg position as this may increase ICP and worsen blood pressure.**
- **Poorly fitted cervical collars may also increase ICP when applied too tightly.**
- **Hypotension:** Usually indicates injury or shock unrelated to the head injury and should be aggressively treated. Fluid resuscitation should be titrated to maintain at least a systolic BP of >100 mmHg in adults and >70 + (2 x age in years) in children. There should be no permissible hypotension in the setting of head injury. It is important to initiate fluid therapy if SBP is approaching 90 SBP or dropping rapidly. Initial fluid bolus should be 1000ml bolus, repeat 500 ml bolus. Repeat to keep SBP >90.  
For pediatric patients, give 20 ml/kg fluid bolus every 5 minutes to achieve desired BP.
- **Traumatic brain injuries involving any of a number of symptoms including confusion, LOC, vomiting, or headache.**
- **Any prolonged confusion or mental status abnormality which does not return to normal within 15 minutes or any documented loss of consciousness should be evaluated by a physician ASAP.**
- **EMS Providers should not make return-to-play decisions when evaluating an athlete with suspected concussion. This is outside the scope of practice.**

<b>Disposition:</b>	<b>EMS Transport:</b>	<b>ALS:</b>	Patient with abnormal neurologic exam, loss of consciousness, respiratory distress, significant mechanism of injury, or vomiting
		<b>BLS:</b>	Patients with normal neurological exam and physical findings suggestive of a head injury

**MD Within 4 Hours:** Patient with normal exam, normal vital signs, and none of the above findings.



# Multiple Trauma



## History

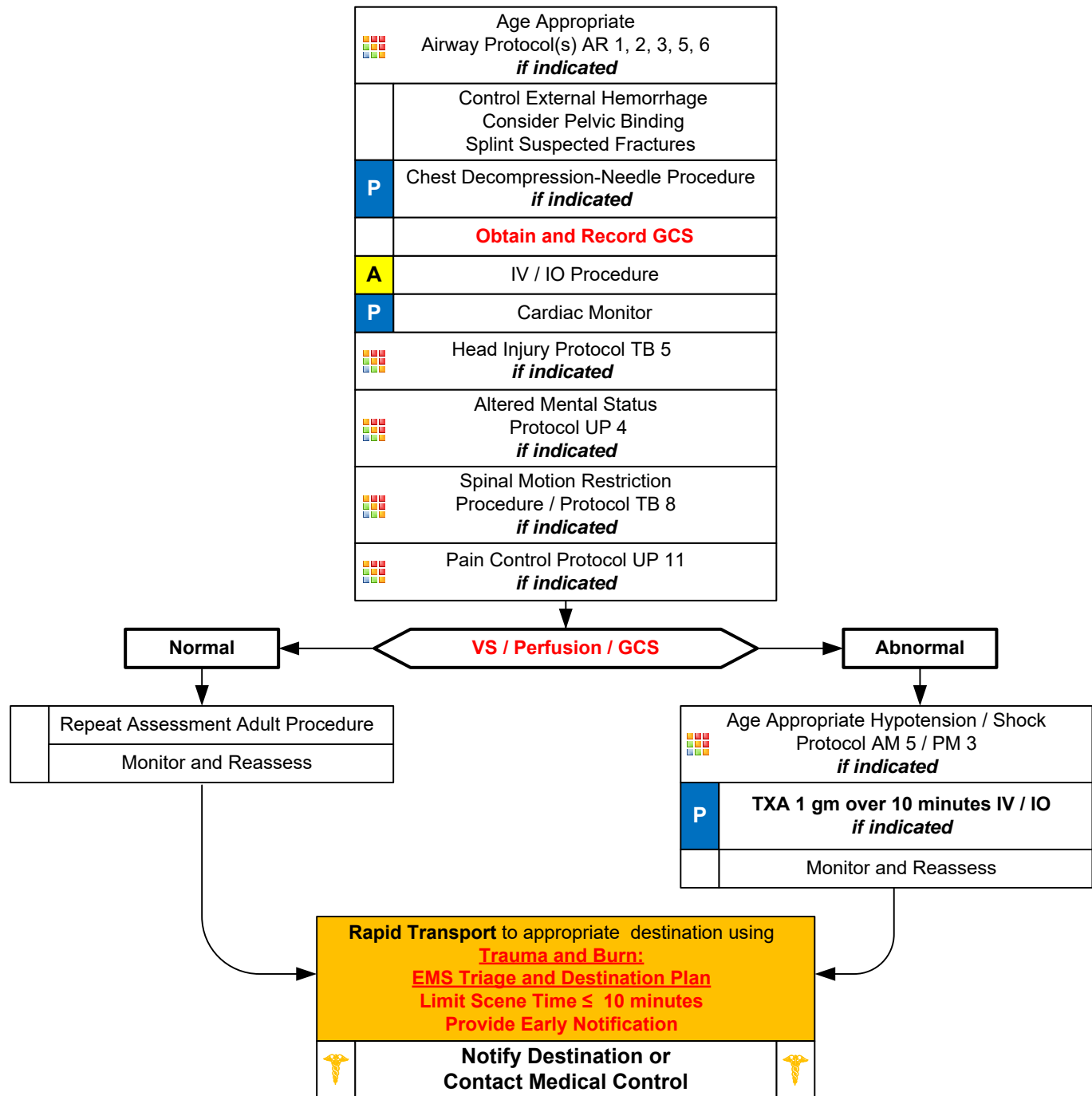
- Time and mechanism of injury
- Damage to structure or vehicle
- Location in structure or vehicle
- Others injured or dead
- Speed and details of MVC
- Restraints / protective equipment
- Past medical history
- Medications

## Signs and Symptoms

- Pain, swelling
- Deformity, lesions, bleeding
- Altered mental status or unconscious
- Hypotension or shock
- Arrest

## Differential (Life threatening)

- Chest: Tension pneumothorax  
Flail chest  
Pericardial tamponade  
Open chest wound  
Hemothorax
- Intra-abdominal bleeding
- Pelvis / Femur fracture
- Spine fracture / Cord injury
- Head injury (see Head Trauma)
- Extremity fracture / Dislocation
- HEENT (Airway obstruction)
- Hypothermia







# Multiple Trauma



## Pearls

- **Recommended Exam:** Mental Status, Skin, HEENT, Heart, Lung, Abdomen, Extremities, Back, Neuro
- **Items in Red Text are key performance measures used in the EMS Acute Trauma Care Toolkit**
- **Transport Destination is chosen based on the EMS System Trauma Plan with EMS pre-arrival notification.**
- **Scene times should not be delayed for procedures. These should be performed en route when possible.**  
**Rapid transport of the unstable trauma patient to the appropriate facility is the goal.**
- **Control external hemorrhage and prevent hypothermia by keeping patient warm.**
- **Consider Chest Decompression with signs of shock and injury to torso and evidence of tension pneumothorax.**
- **Trauma Triad of Death:**  
**Metabolic acidosis / Coagulopathy / Hypothermia**  
**Appropriate resuscitation measures and keeping patient warm regardless of ambient temperature helps to mitigate metabolic acidosis, coagulopathy, and hypothermia.**
- **Bag valve mask is an acceptable method of managing the airway if pulse oximetry can be maintained  $\geq 90\%$**
- **Tranexamic Acid (TXA):**  
Agencies utilizing TXA must have approval from your T-RAC.
- **Trauma in Pregnancy:**  
Providing optimal care for the mother = optimal care for the fetus. After 20 weeks gestation (fundus at or above umbilicus) transport patient on left side with 10 – 20° of elevation.
- **Pediatric Trauma:**  
**Age specific blood pressure 0 – 28 days > 60 mmHg, 1 month - 1 year > 70 mmHg, 1 - 10 years > 70 + (2 x age)mmHg and 11 years and older > 90 mmHg.**
- **Geriatric Trauma:**  
Evaluate with a high index of suspicion.  
Often occult injuries are more difficult to recognize and patients can decompensate unexpectedly with little warning.  
Risk of death with trauma increases after age 55.  
SBP < 110 may represent shock / poor perfusion in patients over age 65.  
Low impact mechanisms, such as ground level falls might result in severe injury especially in age over 65.
- See Regional Trauma Guidelines when declaring Trauma Activation.
- Severe bleeding from an extremity not rapidly controlled with direct pressure may necessitate the application of a tourniquet.
- Maintain high-index of suspicion for domestic violence or abuse, pediatric non-accidental trauma, or geriatric abuse.

## Disposition:

**EMS Transport:**

**ALS:** Abnormal exam, Abnormal vital signs, Loss of consciousness, Respiratory distress, and / or Significant mechanism of injury.

**BLS:** All other patients



# Radiation Incident



## History

- Type of exposure (heat, gas, chemical)
- Inhalation injury
- Time of Injury
- Past medical history / Medications
- Other trauma
- Loss of Consciousness
- Tetanus/Immunization status

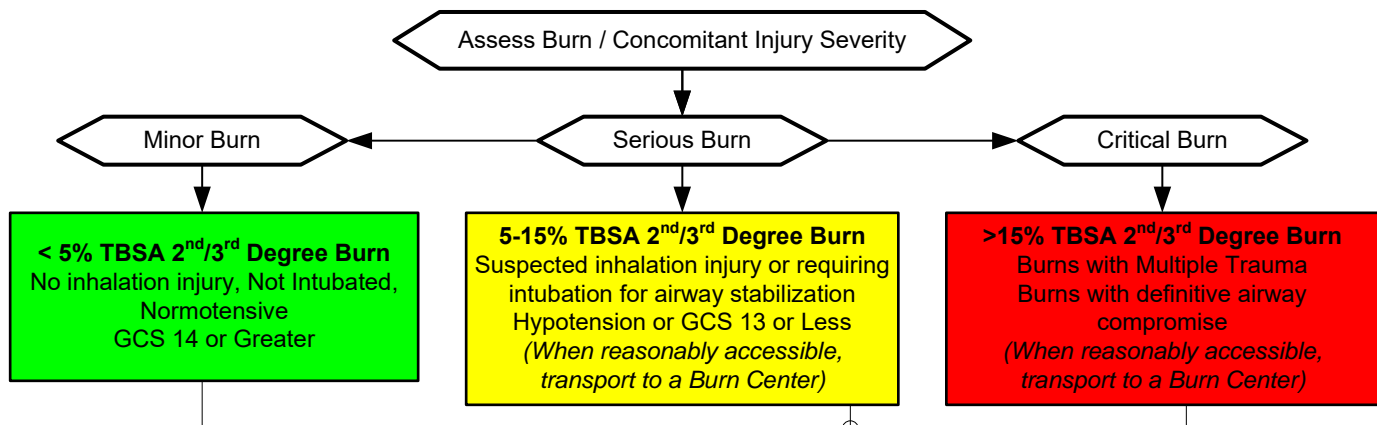
## Signs and Symptoms

- Burns, pain, swelling
- Dizziness
- Loss of consciousness
- Hypotension/shock
- Airway compromise/distress could be indicated by hoarseness/ wheezing / Hypotension

## Differential

- Superficial (1<sup>st</sup> Degree) red - painful (Don't include in TBSA)
- Partial Thickness (2<sup>nd</sup> Degree) blistering
- Full Thickness (3<sup>rd</sup> Degree) painless/ charred or leathery skin
- Thermal injury
- Chemical – Electrical injury
- Radiation injury
- Blast injury






Scene Safety / Quantify and Triage Patients / Load and Go with Assessment / Treatment Enroute



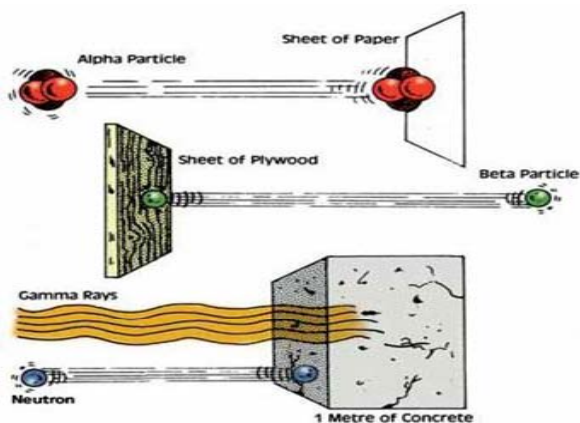
**Collateral Injury:** Most all injuries immediately seen will be a result of collateral injury, such as heat from the blast, trauma from concussion, treat collateral injury based on typical care for the type of injury displayed.

**Qualify:** Determine exposure type; external irradiation, external contamination with radioactive material, internal contamination with radioactive material.

**Quantify:** Determine exposure (generally measured in Grays/Gy). Information may be available from those on site who have monitoring equipment, do not delay transport to acquire this information.

	Age Appropriate Airway Protocol(s) AR 1, 2, 3, 4, 5, 6, 7 <b><i>if indicated</i></b>	
	<u>Eye Involvement</u> Irrigate Involved Eye(s) with Normal Saline for 15 – 30 minutes May repeat as needed	
	Flush Contact Area with Normal Saline for 15 minutes	
	Decontamination Procedure <b><i>if indicated</i></b>	
	Age Appropriate Cardiac Protocol(s) <b><i>as indicated</i></b>	
	Thermal Burn Protocol TB 9 <b><i>if indicated</i></b>	
Rapid Transport to appropriate destination using <b>Trauma and Burn:</b> <b><u>EMS Triage and Destination Plan</u></b>		
	Notify Destination or Contact Medical Control	

Trauma and Burn Protocol Section



Time Phases of Radiation Injury  
(Exposure Dose vs Clinical Outcome)

Exposure Dose (Gy)	Prodrome Severity	Manifest Illness - Symptom Severity			Prognosis
		Hematologic	Gastrointestinal	Neurologic	
0.5 to 1.0	+	+	0	0	Survival almost certain
1.0 to 2.0	+/++	+	0	0	Survival >90 percent
2.0 to 3.5	++	++	0	0	Probable survival
3.5 to 5.5	+++	+++	+	0	Death in 50% at 3.5 to 6 wks
5.5 to 7.5	+++	+++	++	0	Death probable in 2-3 wks
7.5 to 10	+++	+++	+++	0*	Death probable in 1-2.5 wks
10 to 20	+++	+++	+++	+++	Death certain in 5-12 days
> 20	+++	+++	+++	+++**	Death certain in 2-5 days

Abbreviations: Gy: dose in Grey;

0: no effects; +: mild; ++: moderate; +++: severe or marked

\* Hypotension

\*\* Also cardiovascular collapse, fever, shock

Modified from: Waselenko, JK, MacVittie, TJ, Blakely, VF, et al. Medical management of the acute radiation syndrome: Recommendations of the strategic national stockpile radiation working group. Ann Int Med 2004; 140:1039.

## Pearls

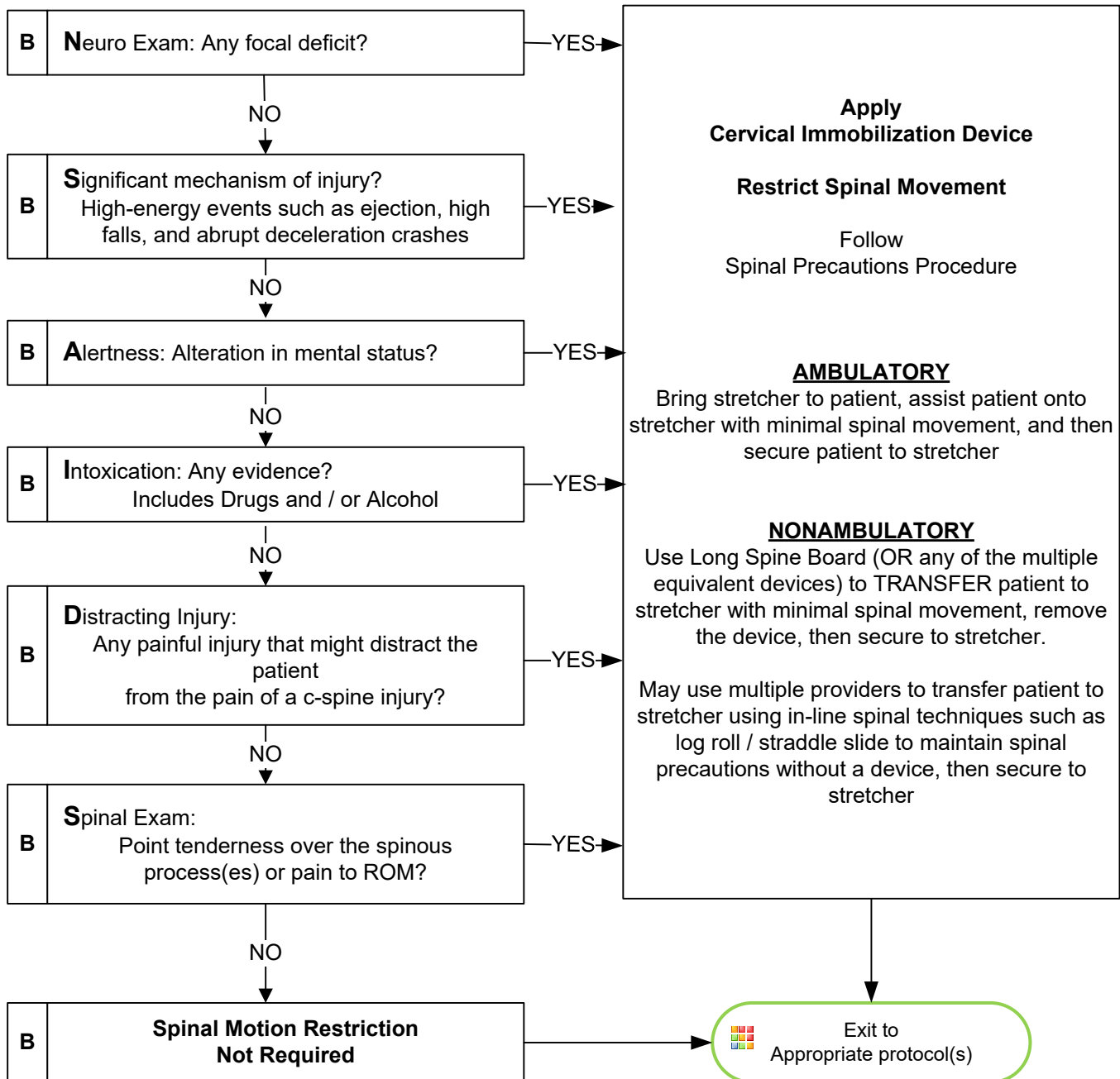
- Dealing with a patient with a radiation exposure can be a frightening experience. Do not ignore the ABC's, a dead but decontaminated patient is not a good outcome. Refer to the Decontamination Procedure for more information.
- Normal Saline or Sterile Water is preferred, however if not available, do not delay irrigation using tap water. Other water sources may be used based on availability. Flush the area as soon as possible with the cleanest readily available water or saline solution using copious amounts of fluids.
- Three methods of exposure:**
  - External irradiation
  - External contamination
  - Internal contamination
- Two classes of radiation:**
  - Ionizing radiation (greater energy) is the most dangerous and is generally in one of three states: Alpha Particles, Beta Particles and Gamma Rays.
  - Non-ionizing (lower energy) examples include microwaves, radios, lasers and visible light.
- Radiation burns with early presentation are unlikely, it is more likely this is a combination event with either thermal or chemical burn being presented as well as a radiation exposure. Where the burn is from a radiation source, it indicates the patient has been exposed to a significant source, (> 250 rem).
- Patients experiencing radiation poisoning are not contagious. Cross contamination is only a threat with external and internal contamination.
- Typical ionizing radiation sources in the civilian setting include soil density probes used with roadway builders and medical uses such as x-ray sources as well as radiation therapy. Sources used in the production of nuclear energy and spent fuel are rarely exposure threats as is military sources used in weaponry. Nevertheless, these sources are generally highly radioactive and in the unlikely event they are the source, consequences could be significant and the patient's outcome could be grave.
- The three primary methods of protection from radiation sources:**
  - Limiting time of exposure
  - Distance from
  - Shielding from the source
- Dirty bombs ingredients generally include previously used radioactive material and combined with a conventional explosive device to spread and distribute the contaminated material.
- Refer to Decontamination Procedure / WMD / Nerve Agent Protocol for dirty contamination events.
- If there is a time lag between the time of exposure and the encounter with EMS, key clinical symptom evaluation includes: Nausea/ Vomiting, hypothermia/hyperthermia, diarrhea, neurological/cognitive deficits, headache and hypotension.
- This event may require an activation of the National Radiation Injury Treatment Network, RITN. UNC Hospitals, Wake Forest-Baptist and Duke are the NC hospitals, with burns managed at UNC and Wake Forest.

## Disposition:

EMS Transport: ALS: All patients



# Selective Spinal Motion Restriction





# Selective Spinal Motion Restriction



## Pearls

- **Recommended Exam: Mental Status, Skin, Neck, Heart, Lungs, Abdomen, Back, Extremities, Neuro**
- **Patients meeting all the above criteria do not require spinal motion restriction. However, patients who fail one or more criteria above require spinal motion restriction, but does NOT require use of the long spine board for immobilization.**
- **Long spine boards are NOT considered standard of care in most cases of potential spinal injury. Spinal motion restriction with cervical collar and securing patient to cot, while padding all void areas is appropriate.**
- **True spinal immobilization is not possible. Spine protection and spinal motion restriction do not equal long spine board.**
- **Spinal motion restriction is always utilized in at-risk patients. These include cervical collar, securing to stretcher, minimizing movement / transfers and maintenance of in-line spine stabilization during any necessary movement / transfers. This includes the elderly or others with body or spine habitus preventing them from lying flat.**
- **Consider spinal motion restriction in patients with arthritis, cancer, dialysis, underlying spine or bone disease.**
- **Range of motion (ROM) is tested by touching chin to chest (look down), extending neck (look up), and turning head from side to side (shoulder to shoulder) without posterior cervical mid-line pain. ROM should NOT be assessed if patient has midline spinal tenderness. Patient's range of motion should not be assisted.**
- **Immobilization on a long spine board is not necessary where:**
  - Penetrating trauma to the head, neck or torso with no signs / symptoms of spinal injury.**
- **Concerning mechanisms that may result in spinal column injury:**
  - Fall from  $\geq 3$  feet and/or  $\geq 5$  stairs or steps**
  - MVC  $\geq 30$  mph, rollover, and/or ejection**
  - Motorcycle, bicycle, other mobile device, or pedestrian-vehicle crash**
  - Diving or axial load to spine**
  - Electric shock**



# Thermal Burn



## History

- Type of exposure (heat, gas, chemical)
- Inhalation injury
- Time of Injury
- Past medical history and Medications
- Other trauma
- Loss of Consciousness
- Tetanus/Immunization status

## Signs and Symptoms

- Burns, pain, swelling
- Dizziness
- Loss of consciousness
- Hypotension/shock
- Airway compromise/distress could be indicated by hoarseness/wheezing

## Differential








- Superficial (1<sup>st</sup> Degree) red - painful (Don't include in TBSA)
- Partial Thickness (2<sup>nd</sup> Degree) blistering
- Full Thickness (3<sup>rd</sup> Degree) painless/charred or leathery skin
- Thermal injury
- Chemical – Electrical injury
- Radiation injury
- Blast injury

Assess Burn / Concomitant Injury Severity

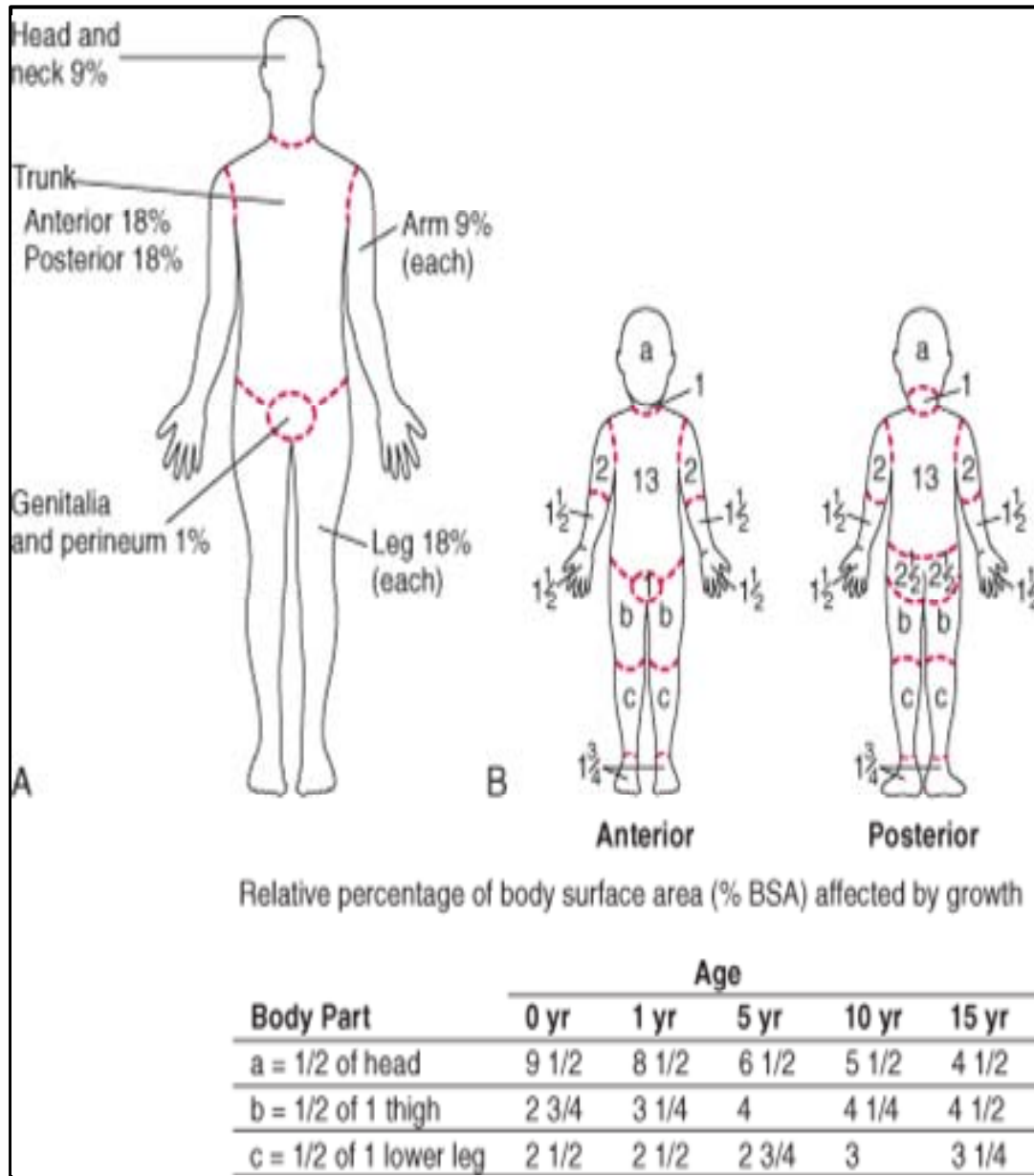
**< 5% TBSA 2<sup>nd</sup>/3<sup>rd</sup> Degree Burn**  
No inhalation injury, Not Intubated,  
Normotensive  
GCS 14 or Greater  
Minor Burn

**5-15% TBSA 2<sup>nd</sup>/3<sup>rd</sup> Degree Burn**  
Suspected inhalation injury or requiring  
intubation for airway stabilization  
Hypotension or GCS 13 or Less  
(When reasonably accessible,  
transport to a Burn Center)  
Serious Burn

**>15% TBSA 2<sup>nd</sup>/3<sup>rd</sup> Degree Burn**  
Burns with Multiple Trauma  
Burns with definitive airway  
compromise  
(When reasonably accessible,  
transport to a Burn Center)  
Critical Burn

	Airway Protocol(s) AR 1, 2, 3, 5, 6 <b>as indicated</b>	
	Multiple Trauma Protocol TB 6 <b>if indicated</b>	
	Remove Rings, Bracelets / Constricting Items	
	Dry Clean Sheet or Dressings	
<b>A</b>	IV / IO Procedure Consider 2 IV sites if greater than 15 % TBSA	
	<b>Normal Saline</b> <b>0.25 mL / kg ( x % TBSA ) / hr</b> for up to the first 8 hours. <b>(More info below)</b> <b>Lactated Ringers if available</b>	
	Pain Control Protocol UP 11 <b>if indicated</b>	
	Carbon Monoxide / Cyanide Protocol TE 2 <b>if indicated</b>	
	Monitor and Reassess	
<b>Rapid Transport</b> to appropriate destination using <b>Trauma and Burn:</b> <b>EMS Triage and Destination Plan</b>		
		
	<b>Notify Destination or Contact Medical Control</b>	

1. Lactated Ringers preferred over Normal Saline. Use if available, if not change over once available.
2. Formula example; an 80 kg (196 lbs.) patient with 50% TBSA will need 1000 cc of fluid per hour.



## Rule of Nines

- Seldom do you find a complete isolated body part that is injured as described in the Rule of Nines.
- More likely, it will be portions of one area, portions of another, and an approximation will be needed.
- For the purpose of determining the extent of serious injury, differentiate the area with minimal or 1<sup>st</sup> degree burn from those of partial (2<sup>nd</sup>) or full (3<sup>rd</sup>) thickness burns.
- For the purpose of determining Total Body Surface Area (TBSA) of burn, include only Partial and Full Thickness burns. Report the observation of other superficial (1<sup>st</sup> degree) burns but do not include those burns in your TBSA estimate.
- Some texts will refer to 4<sup>th</sup>, 5<sup>th</sup> and 6<sup>th</sup> degree burns. There is significant debate regarding the actual value of identifying a burn injury beyond that of the superficial, partial and full thickness burn at least at the level of emergent and primary care. For our work, all are included in Full Thickness burns.
- Other burn classifications in general include:
  - 4<sup>th</sup> referring to a burn that destroys the dermis and involves muscle tissue.
  - 5<sup>th</sup> referring to a burn that destroys dermis, penetrates muscle tissue, and involves tissue around the bone.
  - 6<sup>th</sup> referring to a burn that destroys dermis, destroys muscle tissue, and penetrates or destroys bone tissue.

**Estimate spotty areas of burn by using the size of the patient's palm as 1 %**





- **Recommended Exam: Mental Status, HEENT, Neck, Heart, Lungs, Abdomen, Extremities, Back, and Neuro**
- **Green, Yellow and Red In burn severity do not apply to the Start / JumpStart Triage System.**
- **Critical or Serious Burns:**
  - > 5-15% total body surface area (TBSA) 2<sup>nd</sup> or 3<sup>rd</sup> degree burns, or 3<sup>rd</sup> degree burns > 5% TBSA for any age group, or circumferential burns of extremities, or electrical or lightning injuries, or suspicion of abuse or neglect, or inhalation injury, or chemical burns, or burns of face, hands, perineum, or feet***
- Require direct transport to a Burn Center. Local facility should be utilized only if distance to Burn Center is excessive or critical interventions such as airway management are not available in the field.
- Burn patients are trauma patients, evaluate for multisystem trauma.
- Assure whatever has caused the burn is no longer contacting the injury. (Stop the burning process!)
- Early intubation is required when the patient experiences significant inhalation injuries.
- Circumferential burns to extremities are dangerous due to potential vascular compromise secondary to soft tissue swelling.
- Burn patients are prone to hypothermia - never apply ice or cool the burn, must maintain normal body temperature.
- Evaluate the possibility of geriatric abuse with burn injuries in the elderly.
- Never administer IM pain injections to a burn patient.

**ALS:** All chemical, electrical, or radiological burns, all critical burns, any abnormal vital signs, or any suspected inhalation.

**BLS:** Patient with non-critical burns other than below and SPO2 >94% room air and stable vital signs.

TB 9



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# Adult Obstetrical





# Childbirth / Labor



## History

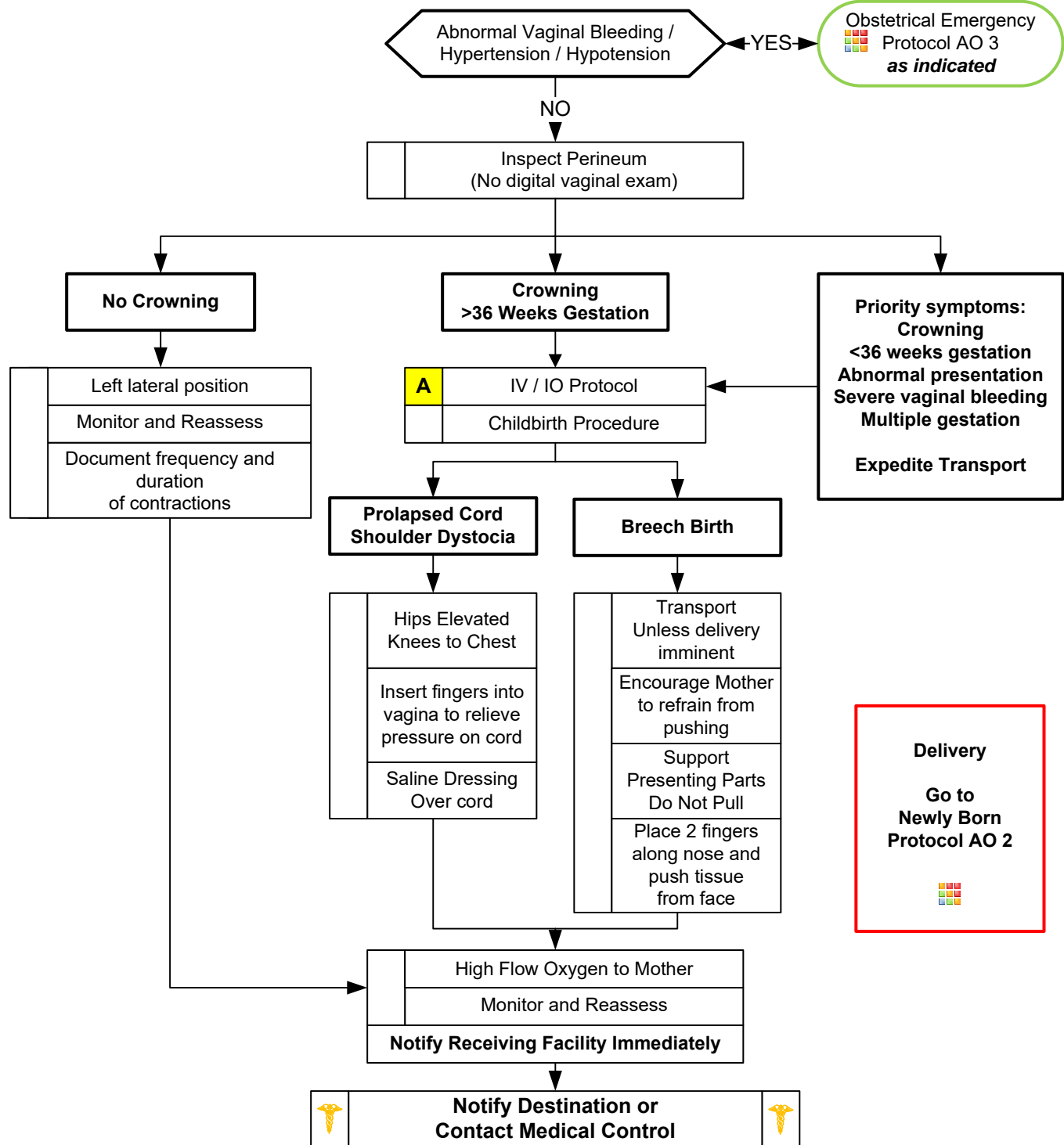
- Due date
- Time contractions started / how often
- Rupture of membranes
- Time / amount of any vaginal bleeding
- Sensation of fetal activity
- Past medical and delivery history
- Medications
- Gravida / Para Status
- High Risk pregnancy

## Signs and Symptoms

- Spasmodic pain
- Vaginal discharge or bleeding
- Crowning or urge to push
- Meconium

## Differential

- Abnormal presentation
  - Buttock
  - Foot
  - Hand
- Prolapsed cord
- Placenta previa
- Abruptio placenta



Adult Obstetrical Protocol Section



# Childbirth / Labor



## Pearls

- **Recommended Exam (of Mother): Mental Status, Heart, Lungs, Abdomen, Neuro**
  - **Record APGAR at 1 minute and 5 minutes after birth.**
  - **After delivery, massaging the uterus (lower abdomen) will promote uterine contraction and help to control post-partum bleeding.**
  - Document all times (delivery, contraction frequency, and length).
  - **Transport or Delivery?**  
Decision to transport versus remain and deliver is multifactorial and difficult. Generally it is preferable to transport. Factors that will impact decision include: number of previous deliveries; length of previous labors; frequency of contractions; urge to push; and presence of crowning.
  - **Maternal positioning for labor:**  
Supine with head flat or elevated per mother's choice. Maintain flexion of both knees and hips. Elevated buttocks slightly with towel. If delivery not imminent, place mother in the left, lateral recumbent position with right side up about 10 – 20°.
  - **Umbilical cord clamping and cutting:**  
Place first clamp about 10 cm from infant's abdomen and second clamp about 5 cm away from first clamp.
  - **Multiple Births:**  
Twins occur about 1/90 births. Typically manage the same as single gestation. If imminent delivery call for additional resources, if needed. Most twins deliver at about 34 weeks so lower birth weight and hypothermia are common. Twins may share a placenta so clamp and cut umbilical cord after first delivery. Notify receiving facility immediately.
  - If maternal seizures occur, refer to the Obstetrical Emergencies Protocol.
  - Some perineal bleeding is normal with any childbirth. Large quantities of blood or free bleeding are abnormal.
- NOTE: Viable Pregnancy confirmed by Last Menstrual Period or Ultrasound is 22 weeks or greater. If there are questions, please contact Medical Control.**

## Disposition:

**EMS Transport:**

**ALS:** Patient with priority symptoms, imminent delivery, or pregnancy risk factors

**BLS:** All other patients



# Newly Born



## History

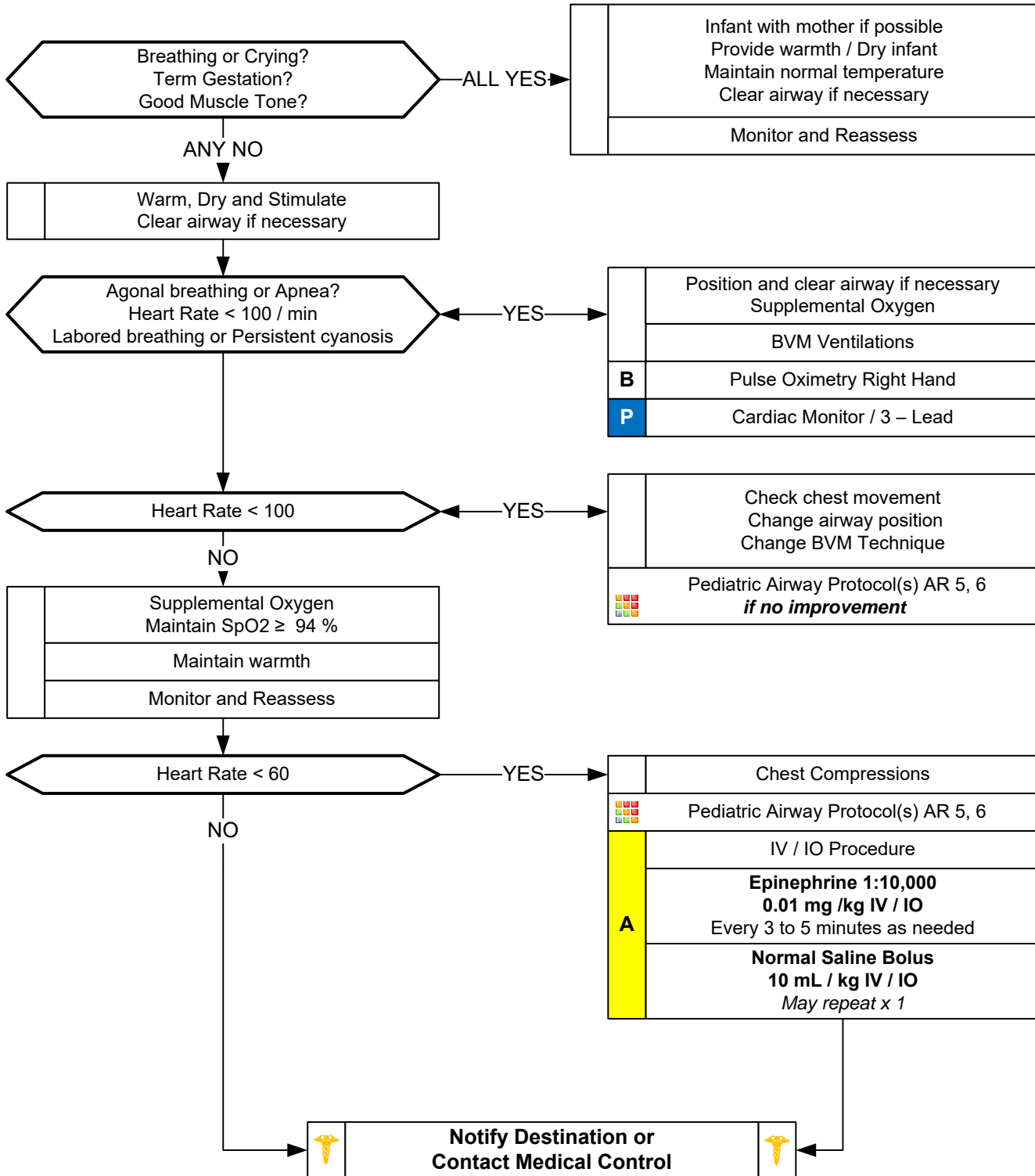
- Due date and gestational age
- Multiple gestation (twins etc.)
- Meconium / Delivery difficulties
- Congenital disease
- Medications (maternal)
- Maternal risk factors such as substance abuse or smoking

## Signs and Symptoms

- Respiratory distress
- Peripheral cyanosis or mottling (normal)
- Central cyanosis (abnormal)
- Altered level of responsiveness
- Bradycardia

## Differential

- Airway failure
  - Secretions
  - Respiratory drive
- Infection
- Maternal medication effect
- Hypovolemia, Hypoglycemia, Hypothermia
- Congenital heart disease





# Newly Born



## Pearls

- **Recommended Exam: Mental Status, Skin, HEENT, Neck, Chest, Heart, Abdomen, Extremities, Neuro**
- **Document 1 and 5 minute Apgars in PCR**
- **Most newborns requiring resuscitation respond to ventilations / BVM, compressions, and/or epinephrine. If infant not responding consider hypovolemia, pneumothorax, and/or hypoglycemia (< 40 mg/dL).**
- **Term gestation, strong cry / breathing and with good muscle tone generally will need no resuscitation. Routine suctioning is no longer recommended.**
- **Most important vital signs in the newly born are respirations / respiratory effort and heart rate.**
- **Maintain warmth of infant following delivery; cap, plastic wrap, thermal mattress, radiant heat.**
- **Meconium staining:**  
Infant born through meconium staining who is not vigorous: Positive pressure ventilation is recommended, direct endotracheal suctioning is no longer recommended.
- **Expected Pulse Oximetry readings immediately following birth:**

1 minute	60 – 65%
2 minutes	65 – 70%
3 minutes	70 – 75%
4 minutes	75 – 80%
5 minutes	80 – 85%
10 minutes	85 – 95%
- **Heart rate is critical during the first few moments of life and is best assessed by 3-lead ECG.**
- **Pulse oximetry should be applied to the right upper arm, wrist, or palm.**
- **CPR in infants is 120 compressions/minute with a 3:1 compression to ventilation ratio. 2-thumbs encircling chest and supporting the back is recommended. Limit interruptions of chest compressions.**
- **Maternal sedation or narcotics will sedate infant (Naloxone NO LONGER recommended-supportive care only).**
- **D10 = D50 diluted (1 ml of D50 with 4 ml of Normal Saline)**

## Disposition:

### EMS Transport:

**ALS:** All patients other than below.

**BLS:** Normal delivery with 5-minute APGAR 9 or 10.



# Obstetrical Emergency



## History

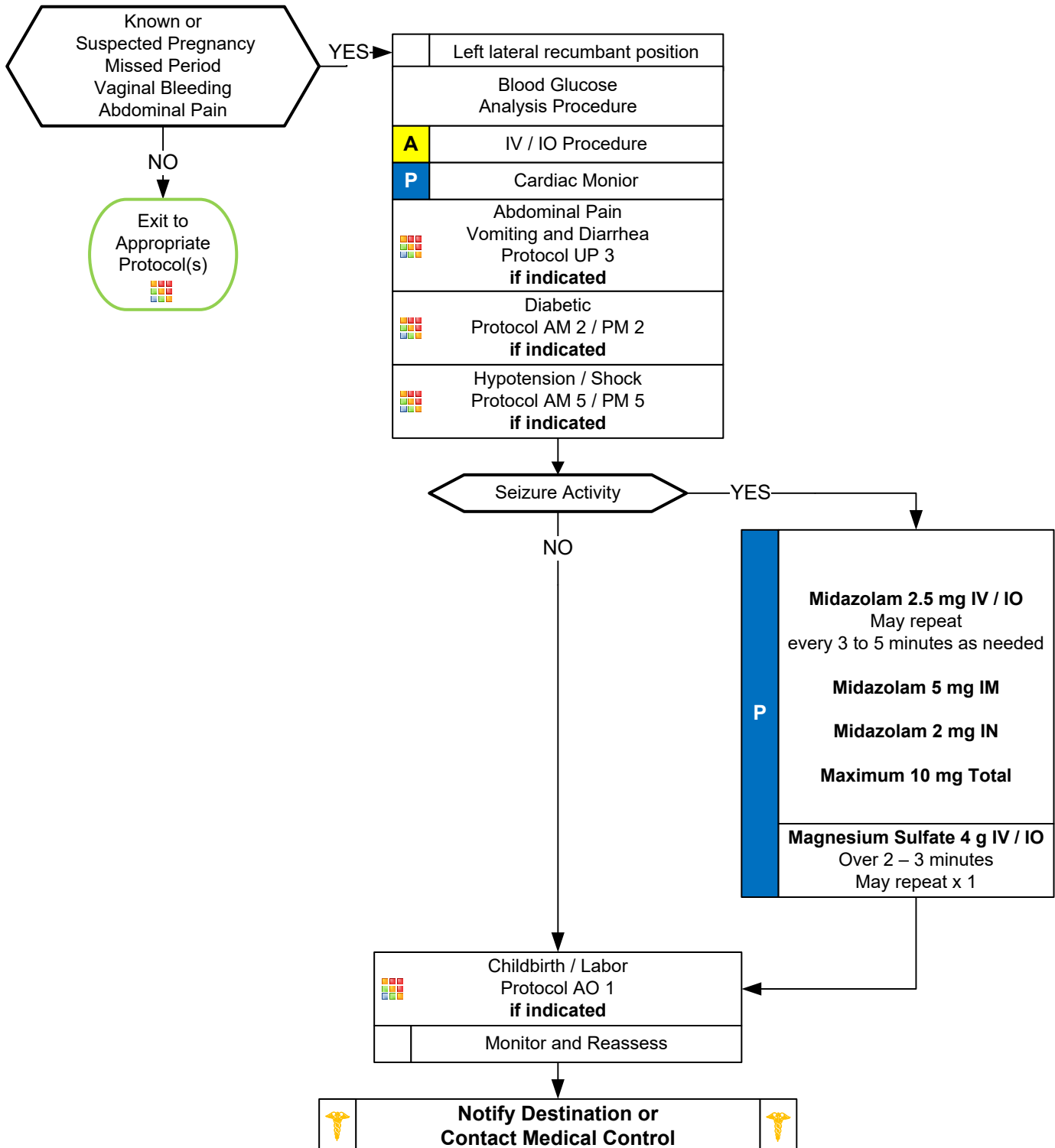
- Past medical history
- Hypertension meds
- Prenatal care
- Prior pregnancies / births
- Gravida / Para

## Signs and Symptoms

- Vaginal bleeding
- Abdominal pain
- Seizures
- Hypertension
- Severe headache
- Visual changes
- Edema of hands and face

## Differential

- Pre-eclampsia / Eclampsia
- Placenta previa
- Placenta abruptio
- Spontaneous abortion





# Obstetrical Emergency



## Pearls

- **Recommended Exam: Mental Status, Abdomen, Heart, Lungs, Neuro**
- **Midazolam 5 – 10 mg IM is effective in termination of seizures. Do not delay IM administration with difficult IV or IO access.**
- **Magnesium Sulfate should be administered as quickly as possible. May cause hypotension and decreased respiratory drive, but typically in doses higher than 6 g.**
- **Any pregnant patient involved in a MVC should be seen immediately by a physician for evaluation. Greater than 20 weeks generally require 4 to 6 hours of fetal monitoring. DO NOT suggest the patient needs an ultrasound.**
- **Ectopic pregnancy:**  
Implantation of fertilized egg outside the uterus, commonly in or on the fallopian tube. As fetus grows, rupture may occur. Vaginal bleeding may or may not be present. Many women with ectopic pregnancy do not know they are pregnant. Usually occurs within 5 to 10 weeks of implantation. Maintain high index of suspicion with women of childbearing age experiencing abdominal pain.
- **Preeclampsia:**  
Occurs in about 6% of pregnancies. Defined by hypertension and protein in the urine. RUQ pain, epigastric pain, N/V, visual disturbances, headache, and hyperreflexia are common symptoms. In the setting of pregnancy, hypertension is defined as a BP greater than 140 systolic or greater than 90 diastolic, or a relative increase of 30 systolic and 20 diastolic from the patient's normal (pre-pregnancy) blood pressure.  
Risk factors: < 20 years of age, first pregnancy, multigestational pregnancy, gestational diabetes, obesity, personal or family history of gestational hypertension.
- **Eclampsia:**  
Seizures occurring in the context of preeclampsia. Remember, women may not have been diagnosed with preeclampsia.
- Maintain patient in a left lateral position, right side up 10 - 20° to minimize risk of supine hypotensive syndrome.
- Ask patient to quantify bleeding - number of pads used per hour.

## Disposition:

- EMS Transport:**    **ALS:**    Any patient other than listed below  
                                 **BLS:**    First trimester bleeding without either hypotension or bleeding > 3 pads per hour



# Pediatric Cardiac





# Pediatric Asystole / PEA



## History

- Events leading to arrest
- Estimated downtime
- SAMPLE
- Existence of terminal illness
- Airway obstruction
- Hypothermia
- Suspected abuse

## Signs and Symptoms

- Pulseless
- Apneic
- No electrical activity on ECG
- No heart tones on auscultation

## Differential

- Respiratory failure
- Foreign body
- Infection (croup, epiglottitis)
- Congenital heart disease
- See Reversible Causes below



Pediatric Pulseless Arrest Protocol

Criteria for Death / No Resuscitation  
Review DNR / MOST Form

YES

Decomposition  
Rigor mortis  
Dependent lividity  
Blunt force trauma  
Injury incompatible with life  
Extended downtime with asystole

Do not begin resuscitation

Follow Deceased Subjects Policy

NO

**Begin Continuous CPR Compressions**  
**Push Hard (1.5 inches Infant / 2 inches in Children)**  
**(≥ 1/3 AP Diameter of Chest)**  
**Push Fast (110 - 120 / min)**  
**Change Compressors every 2 minutes**  
**(Limit changes / pulse checks ≤ 10 seconds)**

**Ventilate 1 breath every 6 seconds**  
**15:2 Compression:Ventilation if no Advanced Airway**

AED Procedure  
*if available*

Search for Reversible Causes

Blood Glucose Analysis Procedure

Cardiac Monitor

**P**

Consider Chest Decompression-Needle Procedure

IV / IO Procedure

**A**

**Epinephrine 1:10,000**  
**0.01 mg/kg IV / IO Maximum Single Dose 1mg**  
**Or**  
**Epinephrine 1:1000 0.1 mg / kg ETT Maximum 2.5 mg**  
**Repeat every 3 – 5 minutes**

**Normal Saline Bolus 20 mL/kg IV / IO**  
**May repeat as needed**  
**Maximum 60 mL/kg**

**P**

**Consider**  
**Epinephrine 0.1 – 1 mcg / kg / min IV / IO**  
**Or**  
**Dopamine 2 – 20 mcg /kg / min IV / IO**  
**See Pearls**

## Reversible Causes

Hypovolemia  
Hypoxia  
Hydrogen ion (acidosis)  
Hypothermia  
Hypo / Hyperkalemia

Tension pneumothorax  
Tamponade; cardiac  
Toxins  
Thrombosis; pulmonary (PE)  
Thrombosis; coronary (MI)

## AT ANY TIME

Return of  
Spontaneous  
Circulation



Go to  
Post Resuscitation  
Protocol



Notify Destination or  
Contact Medical Control



Pediatric Cardiac Protocol Section

# Pediatric Asystole / PEA



## Pearls

- **Recommended Exam: Mental Status**
- **Beginning compressions first is recommended in pediatric patients during CPR. However, the majority of pediatric arrests stem from a respiratory insult or hypoxic event. Compressions should be coupled with ventilations.**
- **When 1 provider is present, perform 30 compressions with 2 ventilations.**
- **When 2 providers are present, perform 15 compressions with 2 ventilations.**
- **Efforts should be directed at high quality and continuous compressions with limited interruptions and early defibrillation when indicated. Compress  $\geq 1/3$  anterior-posterior diameter of chest, in infants 1.5 inches and in children 2 inches. Consider early IO placement if available and / or difficult IV access anticipated.**
- **DO NOT HYPERVENTILATE: If advanced airway in place ventilate 8 – 10 breaths per minute with continuous, uninterrupted compressions.**
- **Do not interrupt compressions to place endotracheal tube. Consider BIAD first to limit interruptions.**
- **High-Quality CPR:**
  - Make sure chest compressions are being delivered at 110 – 120 / min.
  - Make sure chest compressions are adequate depth for age and body habitus.
  - Make sure you allow full chest recoil with each compression to provide maximum perfusion.
  - Minimize all interruptions in chest compressions to < 10 seconds.
  - Do not hyperventilate, ventilate every 6 seconds only.
- **Use AED or apply ECG monitor / defibrillator as soon as available.**
- Airway is a more important intervention in pediatric arrests. This should be accomplished quickly with BVM or BIAD. Patient survival is often dependent on proper ventilation and oxygenation / Airway Interventions.
- Success is based on proper planning and execution. Procedures require space and patient access. Make room to work. Consider Team Focused Approach / Pit-Crew Approach assigning responders to predetermined tasks. Refer to optional protocol.
- **Vasopressor agents:**
  - Dopamine 2 – 20 mcg / kg / min IV / IO**
  - Epinephrine 0.1 – 1 mcg / kg / min IV / IO**
  - Norepinephrine 0.1 – 2 mcg / kg / min IV / IO**
  - Dose Calculation:  $\text{mL} / \text{hour} = \text{kg} \times \text{dose}(\text{mcg} / \text{kg} / \text{min}) \times 60 (\text{min} / \text{hr}) / \text{concentration} (\text{mcg} / \text{mL})$**
- In order to be successful in pediatric arrests, a cause must be identified and corrected.
- If no IV / IO access may use **Epinephrine 1:1000 0.1 mg/kg (0.1 mL/kg) via ETT (Maximum 2.5 mg)**

## Disposition:

**EMS Transport:**      **ALS:**    All patients



# Pediatric Bradycardia With Poor Perfusion



## History

- Past medical history
- Foreign body exposure
- Respiratory distress or arrest
- Apnea
- Possible toxic or poison exposure
- Congenital disease
- Medication (maternal or infant)


## Signs and Symptoms

- Decreased heart rate
- Delayed capillary refill or cyanosis
- Mottled, cool skin
- Hypotension or arrest
- Altered level of consciousness

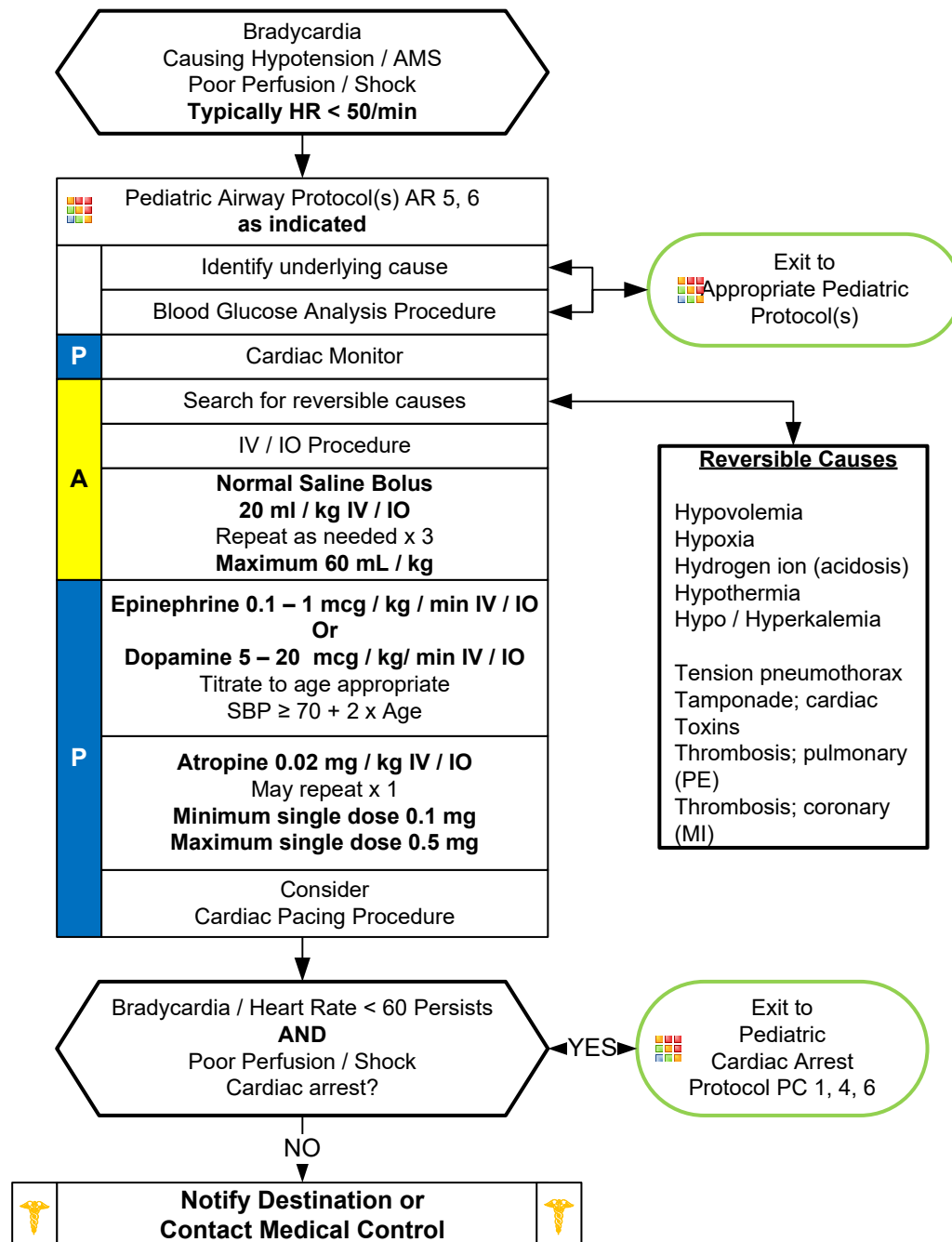
## Differential

- Respiratory failure, Foreign body, Secretions, Infection (croup, epiglottitis)
- Hypovolemia (dehydration)
- Congenital heart disease
- Trauma
- Tension pneumothorax
- Hypothermia
- Toxin or medication
- Hypoglycemia
- Acidosis

**Suspected Beta-Blocker or Calcium Channel Blocker**



**Follow Pediatric Toxicology Protocol**



# Pediatric Bradycardia With Poor Perfusion



## Pearls

- **Recommended Exam: Mental Status, HEENT, Skin, Heart, Lungs, Abdomen, Back, Extremities, Neuro**
- **Use Length-based Resuscitation Tape for drug dosages if applicable.**
- **Ensure patent airway, breathing, and circulation as needed. Administer oxygen. Reassess if bradycardia persists after adequate oxygenation and ventilation.**
- **Bradycardia with adequate pulses, perfusion, and respirations requires no emergency intervention. Monitor and continue evaluation with reassessments.**
- **With HR < 60 / min and poor perfusion despite adequate ventilation and oxygenation, begin CPR immediately.**
- **Epinephrine is first drug choice for persistent, symptomatic bradycardia.**
- **Atropine is second choice, unless there is evidence of increased vagal tone or a primary AV conduction block, then given Atropine first.**
- **Transcutaneous pacing:**
  - Indicated if bradycardia is due to complete heart block or other AV blocks which are not responsive to oxygenation, ventilation, chest compressions, or medications. Indicated with known congenital or acquired heart disease.
  - Transcutaneous pacing is not indicated for asystole or bradycardia due to postarrest hypoxic / ischemic myocardial insult or respiratory failure.
  - Pediatric patients requiring external transcutaneous pacing require the use of pads appropriate for pediatric patients per the manufacturers guidelines.
- **Do not delay therapy when bradycardia is evident and no ECG monitor is available.**
- **Vasopressor agents:**
  - Dopamine 2 – 20 mcg / kg / min IV / IO
  - Epinephrine 0.1 – 1 mcg / kg / min IV / IO
  - Norepinephrine 0.1 – 2 mcg / kg / min IV / IO
  - Dose Calculation:  $\text{mL / hour} = \text{kg} \times \text{dose}(\text{mcg / kg / min}) \times 60 (\text{min / hr}) / \text{concentration} (\text{mcg / mL})$
- The majority of pediatric arrests are due to airway problems.
- Most maternal medications pass through breast milk to the infant so maintain high-index of suspicion for OD-toxins.
- Hypoglycemia, severe dehydration and narcotic effects may produce bradycardia. Many other agents a child ingests can cause bradycardia, often is a single dose.

## Disposition:

**EMS Transport:**

**ALS:** All patients



# Pediatric Pulmonary Edema / CHF



## History

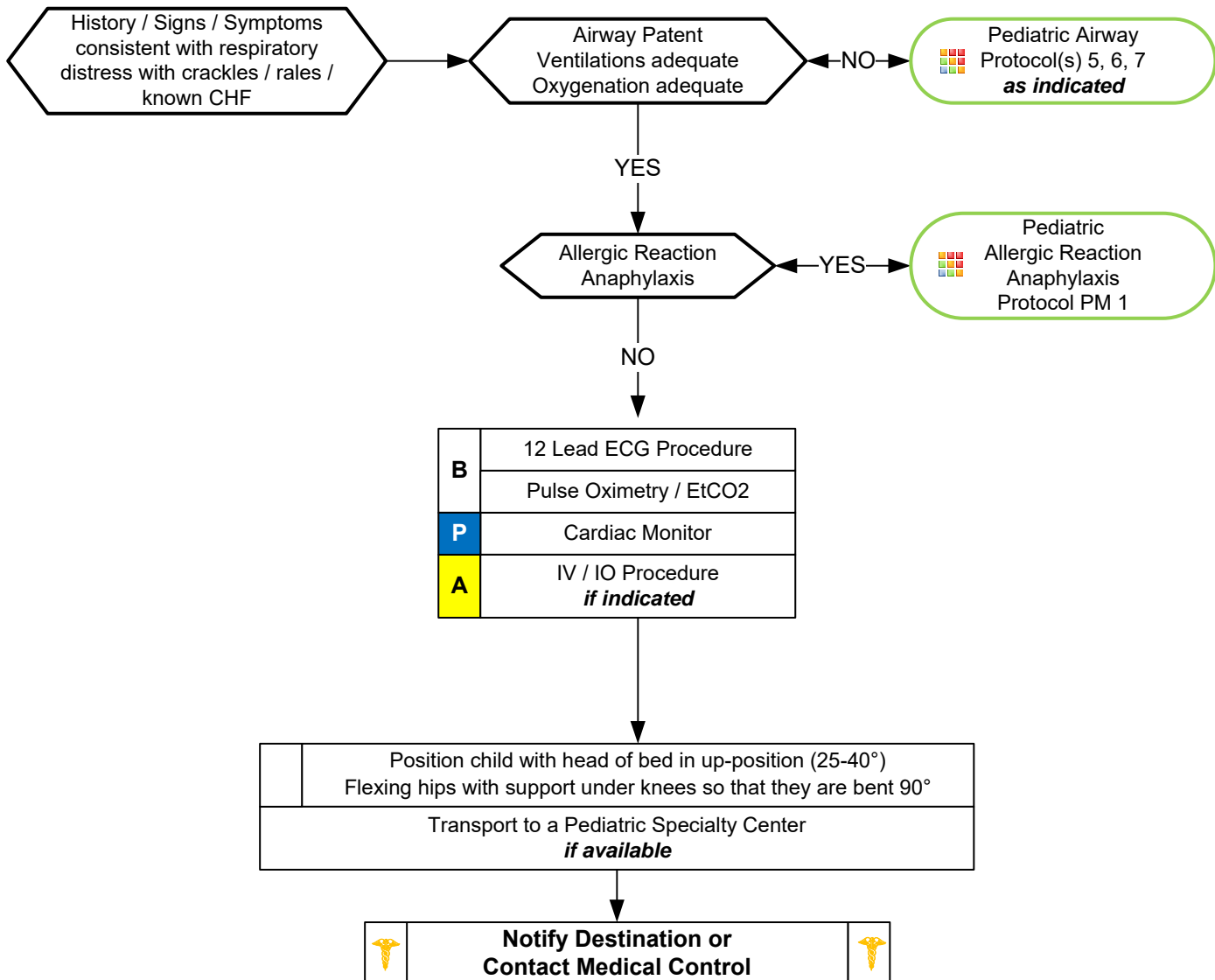
- Congenital Heart Disease
- Chronic Lung Disease
- Congestive heart failure
- Past medical history

## Signs/Symptoms

- Infant: Respiratory distress, poor feeding, lethargy, weight gain, +/- cyanosis
- Child/Adolescent: Respiratory distress, bilateral rales, apprehension, orthopnea, jugular vein distention (rare), pink, frothy sputum, peripheral edema, diaphoresis, chest pain
- Hypotension, shock

## Differential

- Congestive heart failure
- Asthma
- Anaphylaxis
- Aspiration
- Pleural effusion
- Pneumonia
- Pulmonary embolus
- Pericardial tamponade
- Toxic Exposure





# Pediatric Pulmonary Edema / CHF



## Pearls

- **Recommended exam: Mental status, Respiratory, Cardiac, Skin, Neuro**
- **Contact Medical Control early in the care of the pediatric cardiac patient.**
- **Most children with CHF have a congenital heart defect, obtain a precise past medical history.**
- **Congenital heart disease varies by age:**
  - < 1 month: Tetralogy of Fallot, Transposition of the great arteries, Coarctation of the aorta.
  - 2 – 6 months: Ventricular septal defects (VSD), Atrioseptal defects (ASD).
  - Any age: Myocarditis, Pericarditis, SVT, heart blocks.
- **Treatment of Congestive Heart Failure / Pulmonary edema may vary depending on the underlying cause and may include the following with consultation by Medical Control:**
  - Morphine Sulfate: 0.1 mg/kg IV / IO. Max single dose 5mg/dose**
  - Fentanyl: 1 mcg/kg IV / IO. Max single dose 50 mcg.**
  - Nitroglycerin: Dose determined after consultation of Medical Control.**
  - Lasix 1 mg/kg IV / IO.**
  - Agency specific vasopressor.**
- Do not assume all wheezing is pulmonary, especially in a cardiac child: avoid albuterol unless strong history of recurrent wheezing secondary to pulmonary etiology (discuss with Medical Control)

## Disposition:

**EMS Transport: ALS: All patients**



# Pediatric Cardiac Arrest



## History

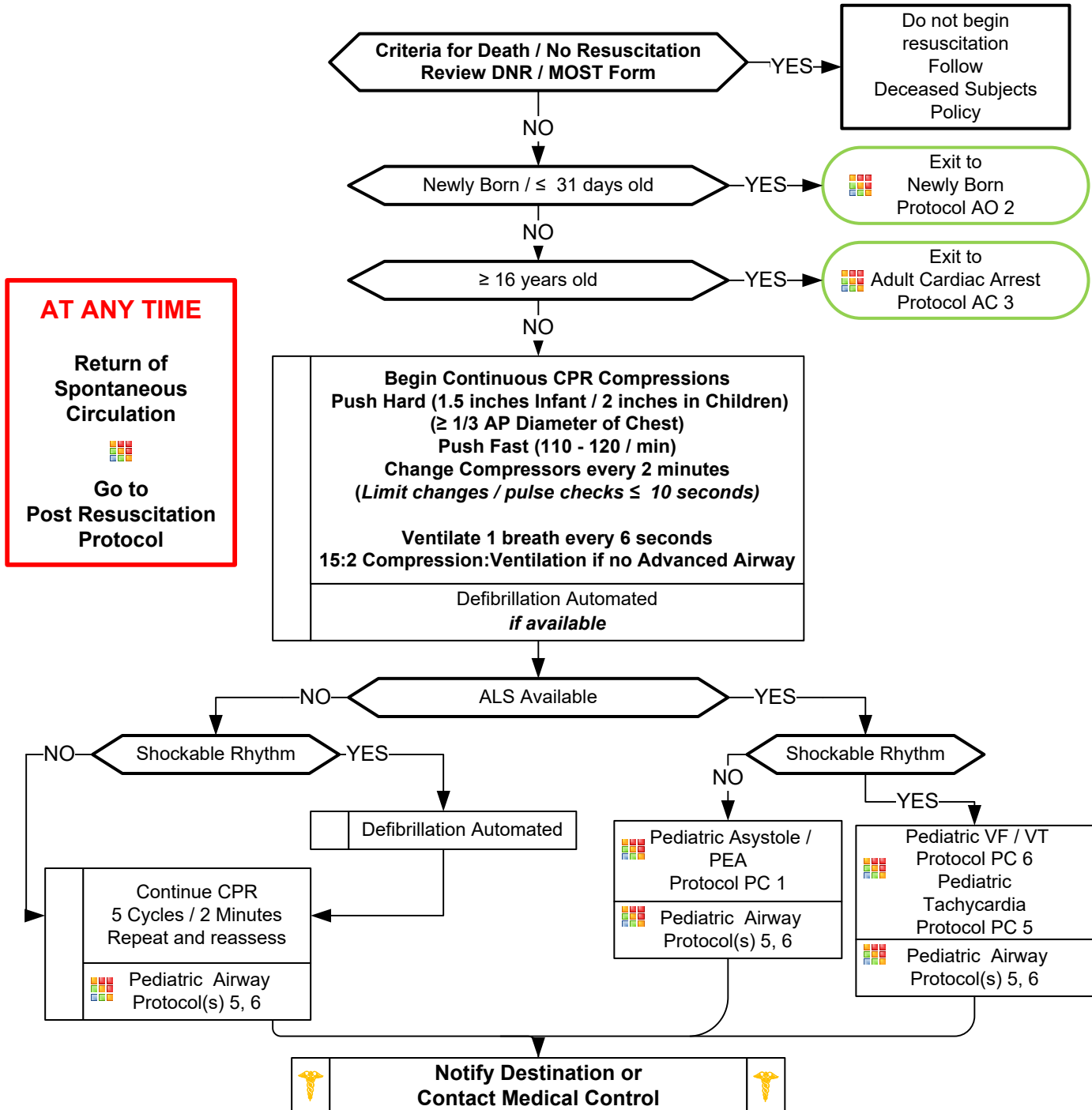
- Time of arrest
- Medical history
- Medications
- Possibility of foreign body
- Hypothermia

## Signs and Symptoms

- Unresponsive
- Cardiac arrest

## Differential

- Respiratory failure: Foreign body, Secretions, Infection (croup, epiglottitis)
- Hypovolemia (dehydration)
- Congenital heart disease
- Trauma
- Tension pneumothorax, cardiac tamponade, pulmonary embolism
- Hypothermia
- Toxin or medication
- Electrolyte abnormalities (Glucose, K)
- Acidosis







# Pediatric Cardiac Arrest



## Pearls

- **Recommended Exam: Mental Status**
- **Beginning compressions first is recommended in pediatric patients during CPR. However, the majority of pediatric arrests stem from a respiratory insult or hypoxic event. Compressions should be coupled with ventilations.**
- **When 1 provider is present, perform 30 compressions with 2 ventilations.**
- **When 2 providers are present, perform 15 compressions with 2 ventilations.**
- **Efforts should be directed at high quality and continuous compressions with limited interruptions and early defibrillation when indicated. Compress  $\geq 1/3$  anterior-posterior diameter of chest, in infants 1.5 inches and in children 2 inches. Consider early IO placement if available and / or difficult IV access anticipated.**
- **DO NOT HYPERVENTILATE: If advanced airway in place ventilate 8 – 10 breaths per minute with continuous, uninterrupted compressions.**
- **Do not interrupt compressions to place endotracheal tube. Consider BIAD first to limit interruptions.**
- **Defibrillation:** First defibrillation is 2 J/kg, second defibrillation is 4 J/kg, subsequent shocks  $\geq 4$  J/kg (Maximum 10 J/kg or adult dose)
- **End Tidal CO<sub>2</sub> (EtCO<sub>2</sub>)**
  - If EtCO<sub>2</sub> is < 10 mmHg, improve chest compressions.
  - If EtCO<sub>2</sub> spikes, typically > 40 mmHg, consider Return of Spontaneous Circulation (ROSC)
- **Special Considerations**
  - Maternal Arrest** - Treat mother per appropriate protocol with immediate notification to Medical Control and rapid transport preferably to obstetrical center if available and proximate. Place mother supine and perform Manual Left Uterine Displacement moving uterus to the patient's left side. IV/ IO access preferably above diaphragm. Defibrillation is safe at all energy levels.
  - Renal Dialysis / Renal Failure** - Refer to Dialysis / Renal Failure protocol caveats when faced with dialysis / renal failure patient experiencing cardiac arrest.
  - Opioid Overdose** - Naloxone cannot be recommended in opioid-associated cardiac arrest. If suspected, attention to airway, oxygenation, and ventilation increase in importance. Naloxone is not associated with improved outcomes in cardiac arrest.
  - Drowning / Suffocation / Asphyxiation / Hanging / Lightning Strike** – Hypoxic associated cardiac arrest and prompt attention to airway and ventilation is priority followed by high-quality and continuous chest compressions and early defibrillation.
- **Transcutaneous Pacing:**
  - Pacing is NOT effective in cardiac arrest and pacing in cardiac arrest does NOT increase chance of survival
- Success is based on proper planning and execution. Procedures require space and patient access. Make room to work. Consider Team Focused Approach / Pit-Crew Approach assigning responders to predetermined tasks. Refer to optional protocol.
- In order to be successful in pediatric arrests, a cause must be identified and corrected.
- If no IV / IO access may use **Epinephrine 1:1000 0.1 mg/kg (0.1 mL/kg) via ETT (Maximum 2.5 mg)**

## Disposition:

**EMS Transport:**      **ALS:**   All patients



# Pediatric Tachycardia



## History

- Past medical history
- Medications or Toxic Ingestion (Aminophylline, Diet pills, Thyroid supplements, Decongestants, Digoxin)
- Drugs (nicotine, cocaine)
- Congenital Heart Disease
- Respiratory Distress
- Syncope or Near Syncope

## Signs and Symptoms

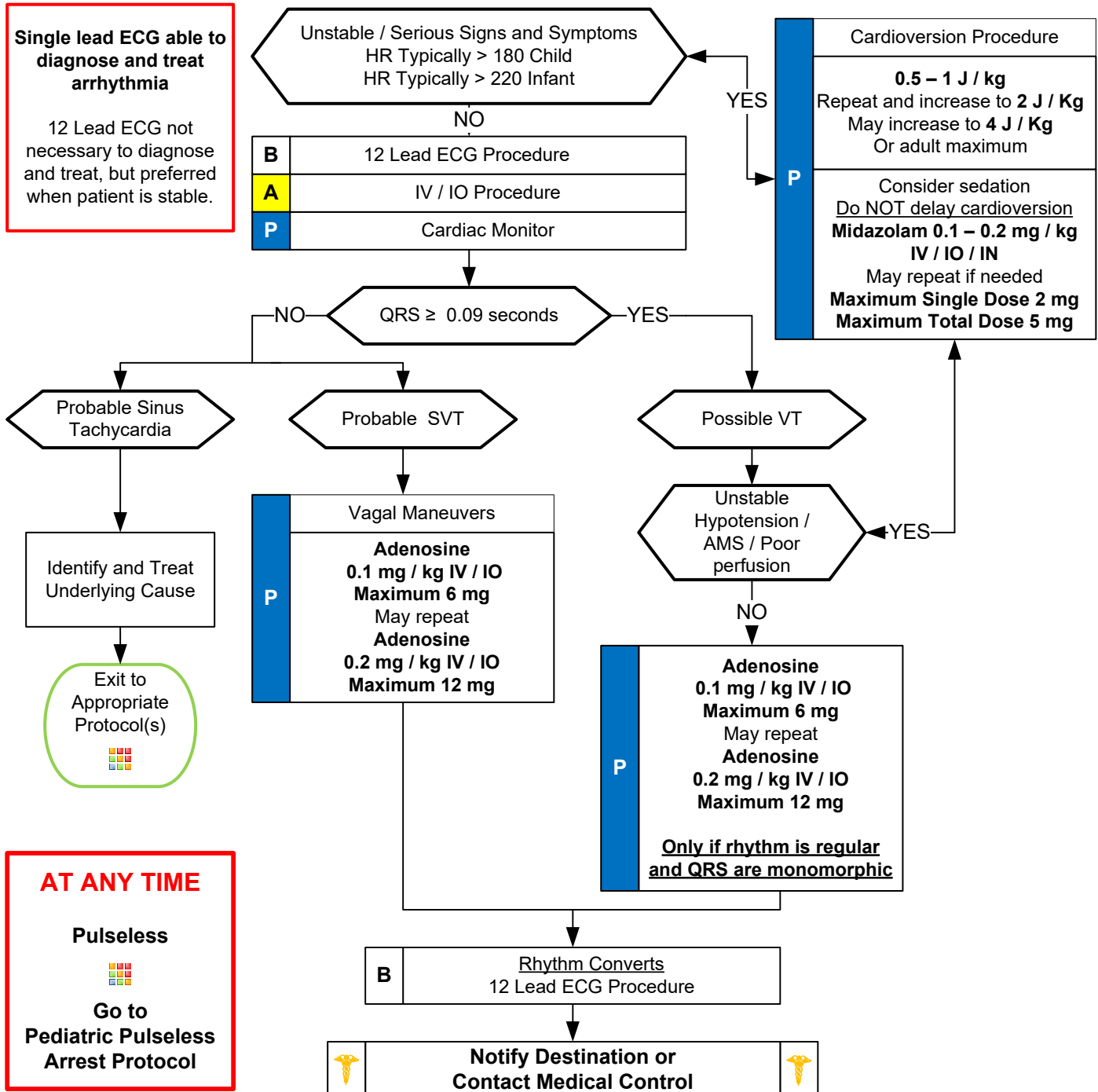
- Heart Rate: Child > 180/bpm  
Infant > 220/bpm
- Pale or Cyanosis
- Diaphoresis
- Tachypnea
- Vomiting
- Hypotension
- Altered Level of Consciousness
- Pulmonary Congestion
- Syncope

## Differential

- Heart disease (Congenital)
- Hypo / Hyperthermia
- Hypovolemia or Anemia
- Electrolyte imbalance
- Anxiety / Pain / Emotional stress
- Fever / Infection / Sepsis
- Hypoxia, Hypoglycemia
- Medication / Toxin / Drugs (see HX)
- Pulmonary embolus
- Trauma, Tension Pneumothorax

### Single lead ECG able to diagnose and treat arrhythmia

12 Lead ECG not necessary to diagnose and treat, but preferred when patient is stable.



Pediatric Cardiac Protocol Section



# Pediatric Tachycardia



## Pearls

- **Recommended Exam: Mental Status, Skin, Neck, Lung, Heart, Abdomen, Back, Extremities, Neuro**
- **Serious Signs and Symptoms:**
  - Respiratory distress / failure.
  - Signs of shock / poor perfusion with or without hypotension.
  - AMS
  - Sudden collapse with rapid, weak pulse
- **Narrow Complex Tachycardia ( $\leq 0.09$  seconds):**
  - Sinus tachycardia: P waves present. Variable R-R waves. Infants usually  $< 220$  beats / minute. Children usually  $< 180$  beats / minute.
  - SVT:  $> 90\%$  of children with SVT will have a narrow QRS ( $\leq 0.09$  seconds.) P waves absent or abnormal. R-R waves not variable. Usually abrupt onset. Infants usually  $> 220$  beats / minute. Children usually  $> 180$  beats / minute.
  - Atrial Flutter / Fibrillation
- **Wide Complex Tachycardia ( $\geq 0.09$  seconds):**
  - SVT with aberrancy.
  - VT: Uncommon in children. Rates may vary from near normal to  $> 200$  / minute. Most children with VT have underlying heart disease / cardiac surgery / long QT syndrome / cardiomyopathy.
  - Amiodarone 5 mg / kg over 20 – 60 minutes or Procainamide 15 mg / kg over 30 – 60 minutes IV / IO** are recommended agents. They should not be administered together. Consultation with Medical Control is advised when these agents are considered.
- **Torsades de Pointes / Polymorphic (multiple shaped) Tachycardia:**
  - Rate is typically 150 to 250 beats / minute.
  - Associated with long QT syndrome, hypomagnesaemia, hypokalemia, many cardiac drugs.
  - May quickly deteriorate to VT.
  - Administer **Magnesium Sulfate 40 mg / kg IV / IO over 10 minutes.** Cardiac arrest given over 2 minutes.
- **Vagal Maneuvers:**
  - Breath holding. Blowing a glove into a balloon. Have child blow out "birthday candles" or through an obstructed straw. Infants: May put a bag of ice water over the upper half of the face careful not to occlude the airway.
- Separating the child from the caregiver may worsen the child's clinical condition.
- Pediatric paddles should be used in children  $< 10$  kg or Broselow-Luten color Purple if available.
- Monitor for respiratory depression and hypotension associated if Diazepam, Lorazepam, or Midazolam is used.
- Continuous pulse oximetry is required for all SVT Patients if available.
- Document all rhythm changes with monitor strips and obtain monitor strips with each therapeutic intervention.
- Generally, the maximum sinus tachycardia rate is 220 – the patient's age in years.

## Disposition:

**EMS Transport:**      **ALS:**    All patients



# Pediatric Ventricular Fibrillation Pulseless Ventricular Tachycardia



## History

- Events leading to arrest
- Estimated downtime
- Past medical history
- Medications
- Existence of terminal illness
- Airway obstruction
- Hypothermia

## Signs and Symptoms

- Unresponsive
- Cardiac Arrest

## Differential

- Respiratory failure / Airway obstruction
- Hyper / hypokalemia, Hypovolemia
- Hypothermia, Hypoglycemia, Acidosis
- Tension pneumothorax, Tamponade
- Toxin or medication
- Thrombosis: Coronary / Pulmonary Embolism
- Congenital heart disease

### Pediatric Pulseless Arrest Protocol



	<p><b>Begin Continuous CPR Compressions</b>  <b>Push Hard (1.5 inches Infant / 2 inches in Children)</b>  <b>(≥ 1/3 AP Diameter of Chest)</b>  <b>(Push Fast (110 - 120 / min)</b>  <b>Change Compressors every 2 minutes</b>  <b>(Limit changes / pulse checks ≤ 10 seconds)</b></p> <p><b>Ventilate 1 breath every 6 seconds</b>  <b>15:2 Compression:Ventilation if no Advanced Airway</b></p>
A	Defibrillation Automated <i>if available</i>
	IV / IO Procedure
	<p><b>Epinephrine 1:10,000</b>  <b>0.01 mg/kg IV / IO Maximum 1mg</b>  <b>Or</b>  <b>Epinephrine 1:1000 0.1 mg / kg ETT</b>  <b>Maximum 2.5 mg</b>  <b>Repeat every 3 – 5 minutes</b></p>
P	Defibrillation Manual Procedure 2 J / Kg
	<p><b><u>If Rhythm Refractory</u></b>  <b>Continue CPR and give Agency specific Anti-arrhythmic(s). Continue epinephrine during compressions.</b>  <b>Continue CPR up to point where you are ready to defibrillate with device charged.</b>  <b>Repeat pattern during resuscitation.</b></p>
P	<p>Continue Antiarrhythmic Utilized  Refer to Appropriate Pediatric Arrhythmia Protocol  <b>See Pearls</b></p>
	<p>Defibrillation Manual Procedure 4 J / Kg  Subsequent shocks ≥ 4 J / kg  Maximum 10 J / kg or adult dose</p>
	<p>Consider  Defibrillation Dual Sequential Manual Procedure  <b>if available and rhythm refractory</b></p>



	<b>Notify Destination or Contact Medical Control</b>	
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## AT ANY TIME

**Return of Spontaneous Circulation**



**Go to Post Resuscitation Protocol**

Pediatric Cardiac Protocol Section

**Persistent VF / VT**  
**Or**  
**Torsades de Points**

**Magnesium Sulfate**  
**40 mg/kg IV / IO over**  
**1 – 2 minutes**  
**May repeat**  
**every 5 minutes**  
**Maximum 2 g**



# Pediatric Ventricular Fibrillation Pulseless Ventricular Tachycardia



## Pearls

- **Recommended Exam: Mental Status**
- **Beginning compressions first is recommended in pediatric patients during CPR. However, the majority of pediatric arrests stem from a respiratory insult or hypoxic event. Compressions should be coupled with ventilations.**
- **When 1 provider is present, perform 30 compressions with 2 ventilations.**
- **When 2 providers are present, perform 15 compressions with 2 ventilations.**
- **Efforts should be directed at high quality and continuous compressions with limited interruptions and early defibrillation when indicated. Compress  $\geq 1/3$  anterior-posterior diameter of chest, in infants 1.5 inches and in children 2 inches. Consider early IO placement if available and / or difficult IV access anticipated.**
- **DO NOT HYPERVENTILATE: If advanced airway in place ventilate 8 – 10 breaths per minute with continuous, uninterrupted compressions.**
- **Do not interrupt compressions to place endotracheal tube. Consider BIAD first to limit interruptions.**
- **Defibrillation:** First defibrillation is 2 J/kg, second defibrillation is 4 J/kg, subsequent shocks  $\geq 4$  J/kg (Maximum 10 J/kg or adult dose)
- **End Tidal CO<sub>2</sub> (EtCO<sub>2</sub>)**
  - If EtCO<sub>2</sub> is < 10 mmHg, improve chest compressions.
  - If EtCO<sub>2</sub> spikes, typically > 40 mmHg, consider Return of Spontaneous Circulation (ROSC)
- **Antiarrhythmic agents:**
  - Adenosine:** First dose: 0.1 mg / kg (Maximum 6 mg) Second dose: 0.2 mg / kg (Maximum 12 mg)
  - Amiodarone** 5 mg / kg IV / IO (single dose Maximum 300 mg). May repeat x 2 to a Maximum of 15 mg / kg. **(Must consult Medical Direction prior to use)**
  - Lidocaine** 1 mg / kg IV / IO. Infusion 20 – 50 mcg / kg / min. If infusion is initiated > 15 minutes from first bolus, repeat 1 mg / kg bolus.
  - Magnesium Sulfate** 40 mg / kg IV / IO over 10 – 20 minutes. In Torsades de pointes give over 1 – 2 minutes. Maximum 2 g.
  - Procainamide** 15 mg / kg IV / IO over 30 – 60 minutes. Monitor for increased QRS and increased QT.
- Success is based on proper planning and execution. Procedures require space and patient access. Make room to work. Consider Team Focused Approach / Pit-Crew Approach assigning responders to predetermined tasks. Refer to optional protocol.
- In order to be successful in pediatric arrests, a cause must be identified and corrected.
- If no IV / IO access may use **Epinephrine 1:1000 0.1 mg/kg (0.1 mL/kg) via ETT (Maximum 2.5 mg)**

## Disposition:

**EMS Transport:**      **ALS:** All patients



# Pediatric Post Resuscitation



## History

- Respiratory arrest
- Cardiac arrest

## Signs/Symptoms

- Return of pulse

## Differential

- Continue to address specific differentials associated with the original dysrhythmia

	Pediatric Airway Protocol(s) AR 5 - 7 <i>as needed</i>
	Monitor Vital Signs / Reassess
	Blood Glucose Analysis Procedure
<b>B</b>	<b>Optimize Ventilation and Oxygenation</b> <ul style="list-style-type: none"><li>• Maintain SpO2 ≥ 90%</li><li>• Preferably SpO2 ≥ 94%</li><li>• Advanced airway if indicated</li><li>• ETCO2 ideally 35 – 45 mm Hg</li><li>• Respiratory Rate 8 – 10</li><li>• Remove Impedance Threshold Device</li></ul> <b>DO NOT HYPERVENTILATE</b>
<b>B</b>	12 Lead ECG Procedure
<b>A</b>	IV / IO Procedure
<b>P</b>	Cardiac Monitor
	Pediatric Diabetic Protocol PM 2 <i>if indicated</i>
	Pediatric Hypotension / Shock Protocol PM 3 <i>if indicated</i>
	Pediatric Bradycardia Protocol PC 2 <i>if indicated</i>
	Pediatric Tachycardia Protocol PC 5 <i>if indicated</i>

## Hypotension Age Based

**0 – 31 Days**  
< 60 mmHg

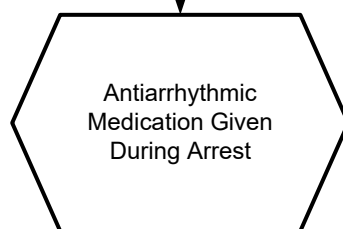
**1 Month to 1 Year**  
< 70 mmHg

**> than 1 Year**  
< 70 + (2 x age) mmHg

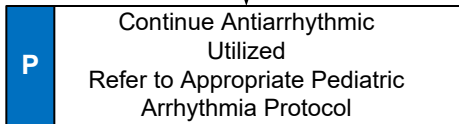
Arrhythmias are common and usually self limiting after ROSC



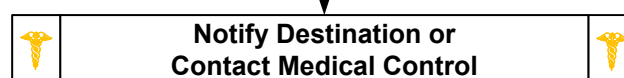
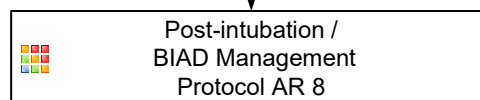
If Arrhythmia Persists follow Rhythm Appropriate Protocol



YES



NO





# Pediatric Post Resuscitation



## Pearls

- **Recommended Exam: Mental Status, Neck, Skin, Lungs, Heart, Abdomen, Extremities, Neuro**
- **Goals of care are to preserve neurologic function, prevent secondary organ damage, treat the underlying cause of illness, and optimize prehospital care. Frequent reassessment is necessary.**
- **Hyperventilation is a significant cause of hypotension / recurrence of cardiac arrest in post resuscitation phase and must be avoided.**
- Target oxygenation to  $\geq 94\%$ . 100 % FiO<sub>2</sub> is not necessary, titrate oxygen accordingly.
- EtCO<sub>2</sub> should be continually monitored with advanced airway in place.
- Administer resuscitation fluids and vasopressor agents to maintain SBP at targets listed on page 1. This table represents minimal SBP targets.
- Targeted Temperature Management is recommended in pediatrics, but prehospital use is not associated with improved outcomes. Transport to facility capable of intensive pediatric care.
- **Antiarrhythmic agents:**
  - Adenosine: First dose: 0.1 mg / kg (Maximum 6 mg) Second dose: 0.2 mg / kg (Maximum 12 mg)
  - Amiodarone 5 mg / kg IV / IO (single dose Maximum 300 mg). May repeat x 2 to a Maximum of 15 mg / kg. **(Must speak with Medical Control prior to administration.)**
  - Lidocaine 1 mg / kg IV / IO. Infusion 20 – 50 mcg / kg / min. If infusion is initiated > 15 minutes from first bolus, repeat 0.5 mg / kg bolus.
  - Magnesium Sulfate 40 mg / kg IV / IO over 10 – 20 minutes. In Torsades de pointes give over 1 – 2 minutes. Maximum 2 g.
  - Procainamide 15 mg / kg IV / IO over 30 – 60 minutes. Monitor for increased QRS and increased QT.
- **Vasopressor agents:**
  - Dopamine 2 – 20 mcg / kg / min IV / IO
  - Epinephrine 0.1 – 1 mcg / kg / min IV / IO
  - Norepinephrine 0.1 – 2 mcg / kg / min IV / IO
  - Dose Calculation:  $\text{mL / hour} = \text{kg} \times \text{dose}(\text{mcg / kg / min}) \times 60 (\text{min / hr}) / \text{concentration} (\text{mcg / mL})$
- If pediatric weight is known, use in drug and fluid calculations. Use actual body weight for calculating initial medication dosages. If unknown then use a body length tape system.
- Appropriate post-resuscitation management may best be planned in consultation with medical control.

## Disposition:

EMS Transport:      ALS:    All patients



# Pediatric Medical





# Pediatric Allergic Reaction



## History

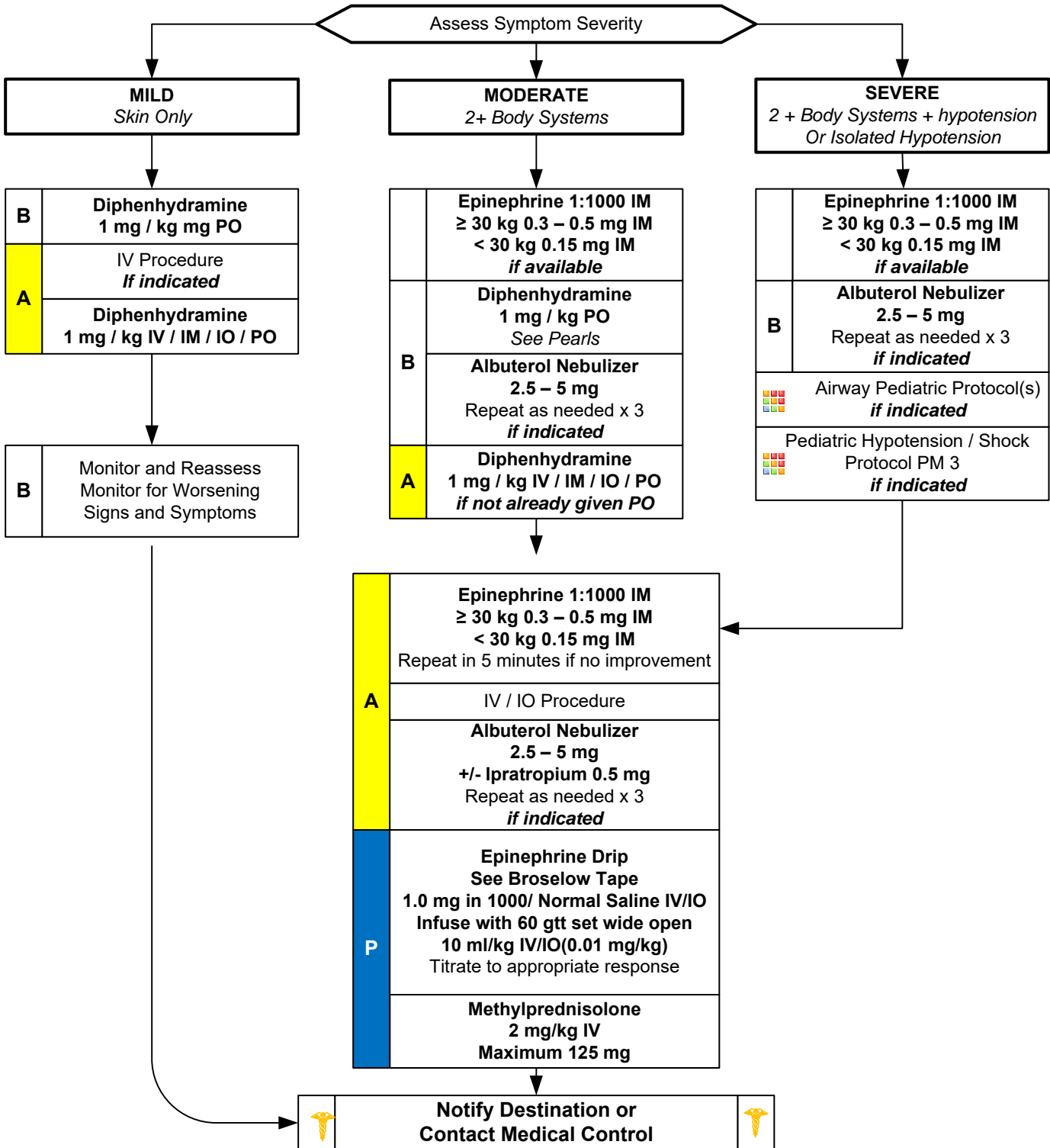
- Onset and location
- Insect sting or bite
- Food allergy / exposure
- Medication allergy / exposure
- New clothing, soap, detergent
- Past medical history / reactions
- Medication history

## Signs and Symptoms

- Itching or hives
- Coughing / wheezing or respiratory distress
- Chest or throat constriction
- Difficulty swallowing
- Hypotension or shock
- Edema

## Differential

- Urticaria (rash only)
- Anaphylaxis (systemic effect)
- Shock (vascular effect)
- Angioedema (drug induced)
- Aspiration / Airway obstruction
- Vasovagal event
- Asthma / COPD / CHF





# Pediatric Allergic Reaction



## Pearls

- **Recommended Exam: Mental Status, Skin, Heart, Lungs**
- **Anaphylaxis is an acute and potentially lethal multisystem allergic reaction.**
- **Epinephrine administration:**
  - Drug of choice and the FIRST drug that should be administered in acute anaphylaxis (Moderate / Severe Symptoms.) IM Epinephrine should be administered in priority before or during attempts at IV or IO access.**
  - Diphenhydramine and steroids have no proven utility in Moderate / Severe anaphylaxis and may be given only After Epinephrine. Diphenhydramine and steroids should NOT delay repeated Epinephrine administration. In Moderate and Severe anaphylaxis Diphenhydramine may decrease mental status. Oral Diphenhydramine should NOT be given to a patient with decreased mental status and / or a hypotensive patient as this may cause nausea and / or vomiting.**
- **Anaphylaxis unresponsive to repeat doses of IM epinephrine may require IV epinephrine administration by IV push or epinephrine infusion. Contact Medical Control for appropriate dosing.**
- **Symptom Severity Classification:**
  - Mild symptoms:**
    - Flushing, hives, itching, erythema with normal blood pressure and perfusion.
  - Moderate symptoms:**
    - Flushing, hives, itching, erythema plus respiratory (wheezing, dyspnea, hypoxia) or gastrointestinal symptoms (nausea, vomiting, abdominal pain) with normal blood pressure and perfusion.
  - Severe symptoms:**
    - Flushing, hives, itching, erythema plus respiratory (wheezing, dyspnea, hypoxia) or gastrointestinal symptoms (nausea, vomiting, abdominal pain) with hypotension and poor perfusion.
- **Allergic reactions may occur with only respiratory and gastrointestinal symptoms and have no rash / skin involvement.**
- **Angioedema is seen in moderate to severe reactions and is swelling involving the face, lips or airway structures. This can also be seen in patients taking blood pressure medications like Prinivil / Zestril (lisinopril)-typically end in -il.**
- **Fluids and Medication titrated to maintain a SBP  $>70 + (\text{age in years} \times 2)$  mmHg.**
- **EMR / EMT may administer Epinephrine IM and may administer from EMS supply.** Agency Medical Director may require contact of medical control prior to EMR / EMT administering any medication.
- **EMT may administer diphenhydramine by oral route only and may administer from EMS supply.** Agency Medical Director may require contact of medical control prior to EMT / EMR administering any medication.
- **EMT may administer Albuterol if patient already prescribed and may administer from EMS supply.** Agency Medical Director may require contact of medical control prior to EMT / EMR administering any medication.
- **Patients with moderate and severe reactions should receive a 12 lead ECG and should be continually monitored, but this should NOT delay administration of epinephrine.**
- **The shorter the onset from exposure to symptoms the more severe the reaction.**

## Disposition:

- EMS Transport:** **ALS:** All patients who exhibit abnormal vital signs, facial swelling, and/or receive Epinephrine  
**BLS:** Increased rash, not improved with Diphenhydramine  
Persistent (or recurrent) rash
- MD Within 24 Hours:** Consult with MD and rash with no associated symptoms and responsive to



# Pediatric Diabetic



## History

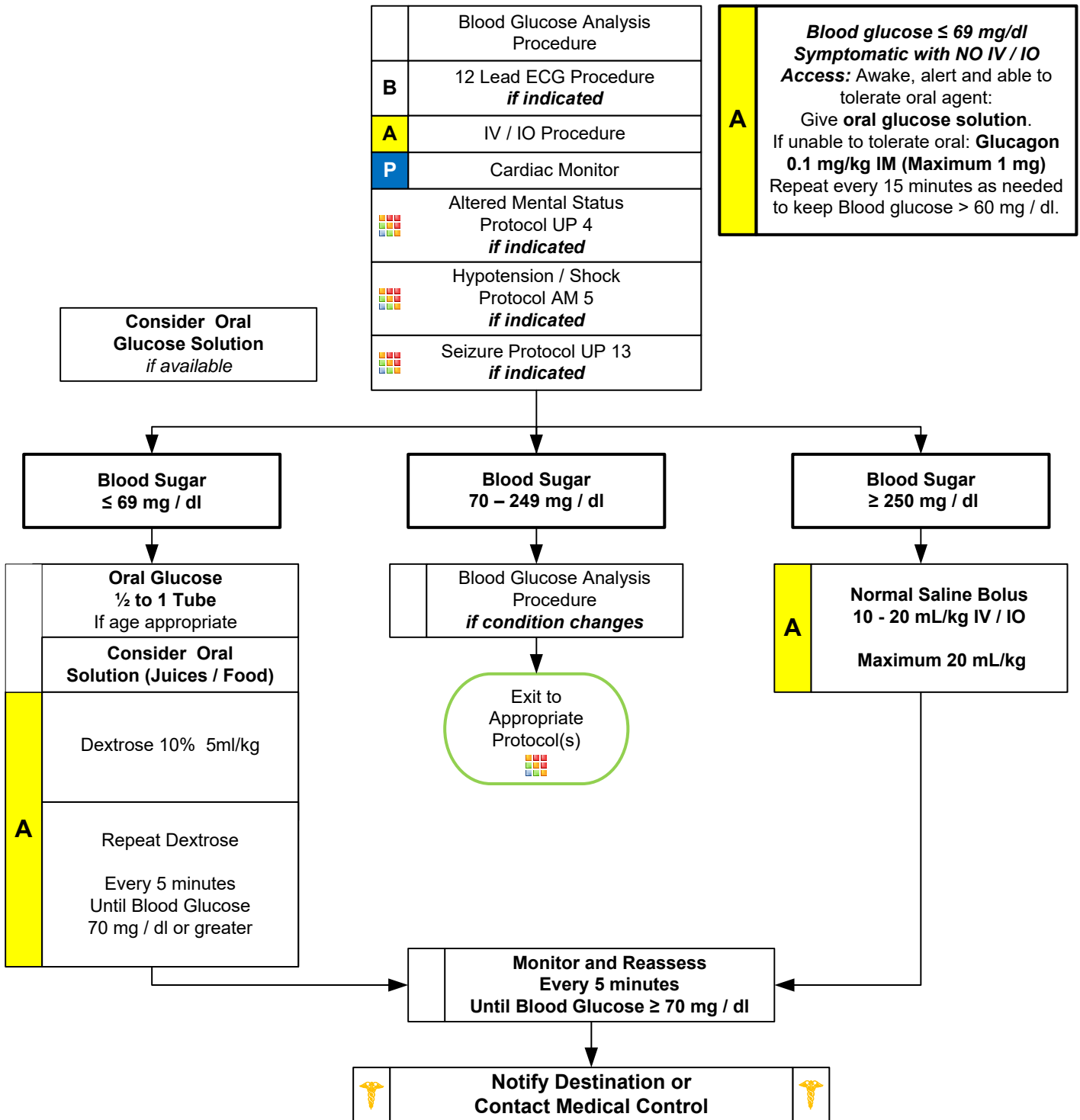
- Past medical history
- Medications
- Recent blood glucose check
- Last meal

## Signs and Symptoms

- Altered mental status
- Combative / irritable
- Diaphoresis
- Seizures
- Abdominal pain
- Nausea / vomiting
- Weakness
- Dehydration
- Deep / rapid breathing

## Differential

- Alcohol / drug use
- Toxic ingestion
- Trauma; head injury
- Seizure
- CVA
- Altered baseline mental status.





# Pediatric Diabetic

## Pearls

- **Recommended Exam: Mental Status, HEENT, Skin, Heart, Lungs, Abdomen, Back, Extremities, Neuro**
- **Patients with prolonged hypoglycemia may not respond to glucagon.**
- **Do not administer oral glucose to patients that are not able to swallow or protect their airway.**
- **Quality control checks should be maintained per manufacturers recommendation for all glucometers.**
- **D10 / D25 Preparation:**
  - D10:** Remove 10 mL of D50 from a D50 vial. Add 40 mL of NS with the 10 mL of D50 – total volume 50 mL.
  - D10: Alternative,** Discard 40 mL from the D50 vial and draw up 40 mL of NS – total volume 50 mL.
  - D25:** Remove 25 mL of D50 and draw up 25 mL of NS – total volume 50 mL.
- In extreme circumstances with no IV and no response to glucagon Dextrose 50 % can be administered rectally. Contact medical control for advice.
- **Patient's refusing transport to medical facility after treatment of hypoglycemia:**
  - Adult caregiver must be present with pediatric patient.
  - Blood sugar must be  $\geq 80$ , patient has ability to eat and availability of food with responders on scene.
  - Patient must have known history of diabetes and not taking any oral diabetic agents.
  - Patient returns to normal mental status and has a normal neurological exam with no new neurological deficits.
  - Must demonstrate capacity to make informed health care decisions. See Universal Patient Care Protocol UP-1.
  - Otherwise contact medical control.
- **Hypoglycemia with Oral Agents:**
  - Patients taking oral diabetic medications should be strongly encouraged to allow transportation to a medical facility. They are at risk of recurrent hypoglycemia that can be delayed for hours and require close monitoring even after normal blood glucose is established. Not all oral agents have prolonged action so Contact Medical Control for advice. Patients who meet criteria to refuse care should be instructed to contact their physician immediately and consume a meal.
- **Hypoglycemia with Insulin Agents:**
  - Many forms of insulin now exist. Longer acting insulin places the patient at risk of recurrent hypoglycemia even after a normal blood glucose is established. Not all insulins have prolonged action so Contact Medical Control for advice. Patients who meet criteria to refuse care should be instructed to contact their physician immediately and consume a meal.

## Disposition:

- EMS Transport:**      **ALS:** All patients other than listed below  
                                 **BLS:** Hypoglycemia with normal exam post Dextrose



# Pediatric Hypotension / Shock



## History

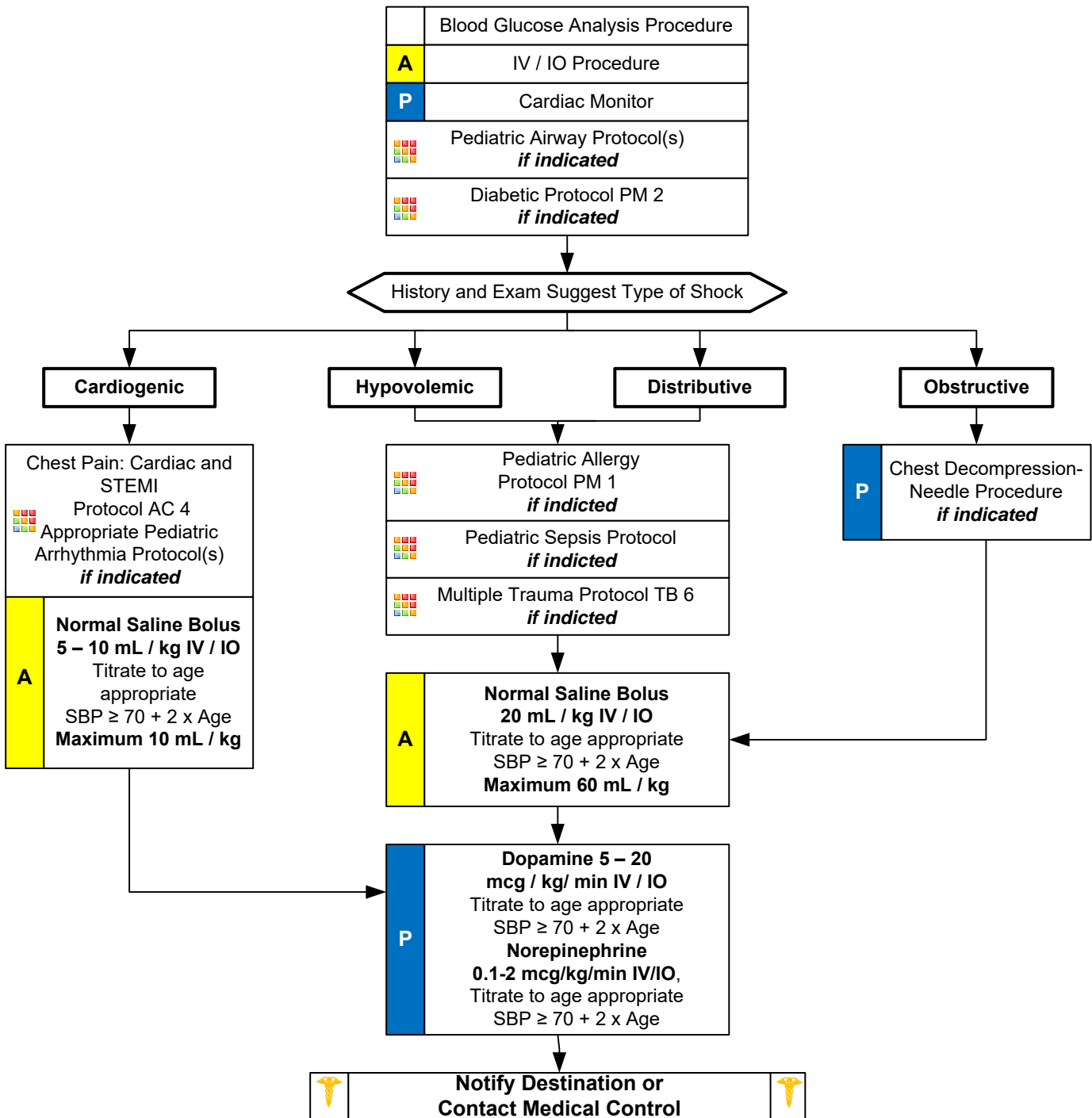
- Blood loss
- Fluid loss
- Vomiting
- Diarrhea
- Fever
- Infection

## Signs and Symptoms

- Restlessness, confusion, weakness
- Dizziness
- Tachycardia
- Hypotension (Late sign)
- Pale, cool, clammy skin
- Delayed capillary refill
- Dark-tarry stools

## Differential

- Shock
  - Hypovolemic
  - Cardiogenic
  - Septic
  - Neurogenic
  - Anaphylactic
- Trauma
- Infection
- Dehydration
- Congenital heart disease
- Medication or Toxin





# Pediatric Hypotension / Shock



## Pearls

- **Recommended Exam: Mental Status, Skin, Heart, Lungs, Abdomen, Back, Extremities, Neuro**
- **Lowest blood pressure by age: < 31 days: > 60 mmHg. 31 days to 1 year: > 70 mmHg. Greater than 1 year:  $70 + 2 \times \text{age in years}$ .**
- Consider all possible causes of shock and treat per appropriate protocol. Majority of decompensation in pediatrics is airway related.
- Decreasing heart rate and hypotension occur late in children and are signs of imminent cardiac arrest.
- Shock may be present with a normal blood pressure initially.
- Shock often is present with normal vital signs and may develop insidiously. Tachycardia may be the only manifestation.
- Consider all possible causes of shock and treat per appropriate protocol.
- **Hypovolemic Shock:**  
Hemorrhage, trauma, GI bleeding, ruptured aortic aneurysm or pregnancy-related bleeding.
- **Cardiogenic Shock:**  
Heart failure: MI, Cardiomyopathy, Myocardial contusion, Ruptured ventricular / septum / valve / toxins.
- **Distributive Shock:**  
Septic  
Anaphylactic  
Neurogenic: Hallmark is warm, dry, pink skin with normal capillary refill time and typically alert.  
Toxic
- **Obstructive Shock:**  
Pericardial tamponade. Pulmonary embolus. Tension pneumothorax.  
Signs may include hypotension with distended neck veins, tachycardia, unilateral decreased breath sounds or muffled heart sounds.

## **Acute Adrenal Insufficiency or Congenital Adrenal Hyperplasia:**

Body cannot produce enough steroids (glucocorticoids / mineralocorticoids.) May have primary or secondary adrenal disease, congenital adrenal hyperplasia, or more commonly have stopped a steroid like prednisone. Injury or illness may precipitate. Usually hypotensive with nausea, vomiting, dehydration and / or abdominal pain. **If suspected Paramedic should give Methylprednisolone 125 mg IM / IV / IO or Dexamethasone 10 mg IM / IV / IO. Use steroid agent specific to your drug list. May administer prescribed steroid carried by patient IM / IV / IO. Patient may have Hydrocortisone (Cortef or Solu-Cortef). Dose: < 1y.o. give 25 mg, 1-12 y.o. give 50 mg, and > 12 y.o. give 100 mg or dose specified by patient's physician.**

## Disposition:

EMS Transport:      ALS:    All patients



# Toxic and Environmental





# Bites and Envenomations



## History

- Type of bite / sting
- Description / photo for identification
- Time, location, size of bite / sting
- Previous reaction to bite / sting
- Domestic vs. Wild
- Tetanus and Rabies risk
- Immunocompromised patient

## Signs and Symptoms

- Rash, skin break, wound
- Pain, soft tissue swelling, redness
- Blood oozing from the bite wound
- Evidence of infection
- Shortness of breath, wheezing
- Allergic reaction, hives, itching
- Hypotension or shock

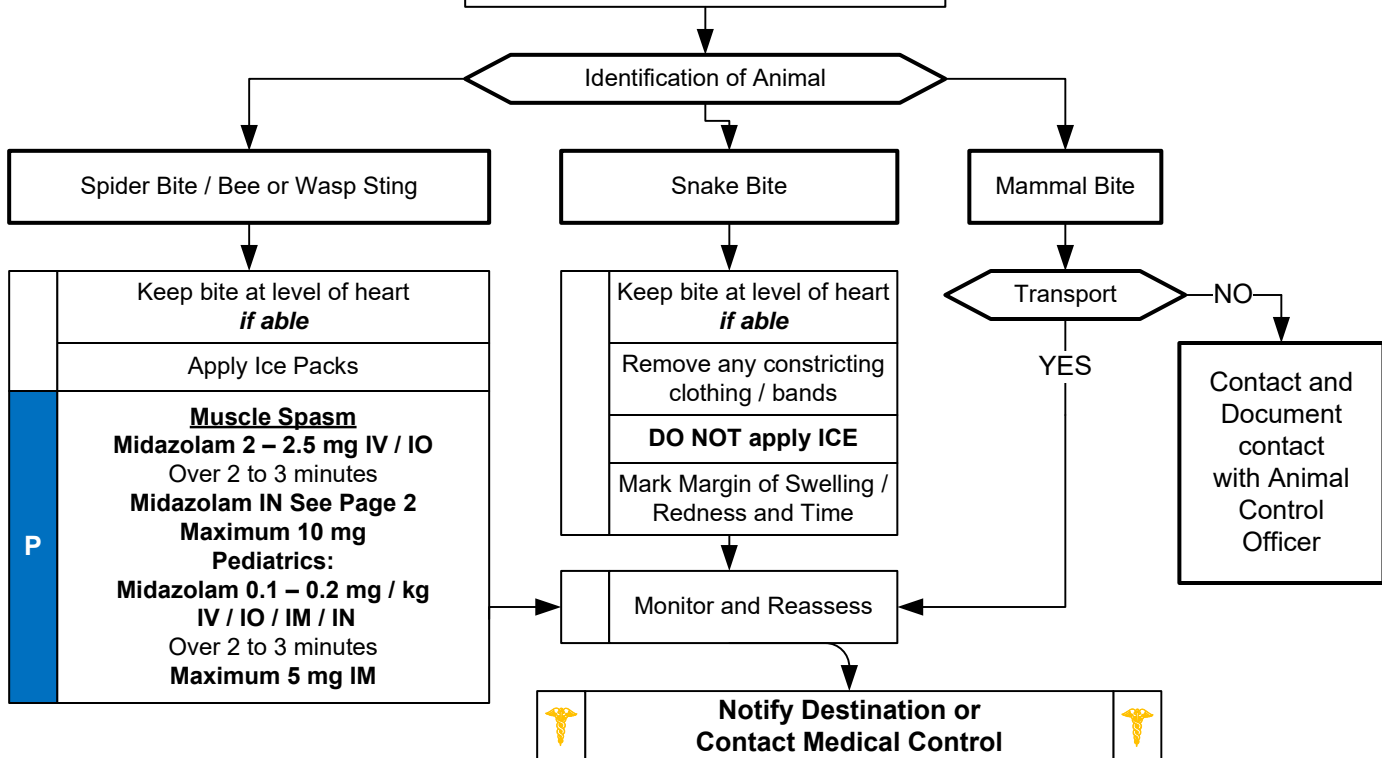
## Differential

- Animal bite
- Human bite
- Snake bite (poisonous)
- Spider bite (poisonous)
- Insect sting / bite (bee, wasp, ant, tick)
- Infection risk
- Rabies risk
- Tetanus risk

Call for help / additional resources  
Stage until scene safe

If Needed  
Carolinas Poison Control  
1-800-222-1222

	General Wound Care Procedure
	Immobilize Injury
	Remove any constricting clothing / bands / jewelry
A	IV / IO Procedure <i>if indicated</i>
	Age Appropriate Trauma Protocol(s) TB 4, 5, 6 <i>if indicated</i>
	Age Appropriate Allergic Reaction/ Anaphylaxis Protocol AM 1 / PM 1 <i>if indicated</i>
	Age Appropriate Hypotension / Shock Protocol AM 5 / PM 3 <i>if indicated</i>
	Pain Control Protocol UP 11 <i>if indicated</i>
	Extremity Trauma Protocol TB 4 <i>if indicated</i>







# Bites and Envenomations



## Pearls

- **Recommended Exam: Mental Status, Skin, Extremities (Location of injury), and a complete Neck, Lung, Heart, Abdomen, Back, and Neuro exam if systemic effects are noted**
- **Immunocompromised patients are at an increased risk for infection: diabetes, chemotherapy, transplant patients.**
- **Consider contacting the North Carolina Poison Control Center for guidance (1-800-222-1222).**
- **Do not put responders in danger attempting to capture and animal or insect for identification purposes.**
- **Evidence of infection: swelling, redness, drainage, fever, red streaks proximal to wound.**
- **Human bites:**  
Human bites have higher infection rates than animal bites due to normal mouth bacteria.
- **Dog / Cat / Carnivore bites:**  
Carnivore bites are much more likely to become infected and all have risk of Rabies exposure.  
Cat bites may progress to infection rapidly due to a specific bacteria (Pasteurella multocida).
- **Snake bites:**  
Poisonous snakes in this area are generally of the pit viper family: rattlesnake and copperhead.  
Coral snake bites are rare: Very little pain but very toxic. "Red on yellow - kill a fellow, red on black – venom lack."  
Amount of envenomation is variable, generally worse with larger snakes and early in spring.  
If no pain or swelling, envenomation is unlikely. About 25 % of snake bites are "dry" bites.
- **Spider bites:**  
Black Widow spider bites tend to be minimally painful, but over a few hours, muscular pain and severe abdominal pain may develop (spider is black with red hourglass on belly).  
Brown Recluse spider bites are minimally painful to painless. Little reaction is noted initially but tissue necrosis at the site of the bite develops over the next few days (brown spider with fiddle shape on back).

## Disposition:

EMS Transport:	<b>ALS:</b>	Anaphylaxis Respiratory distress Poisonous snakebite SQ Epinephrine used	Rapid progression of symptoms Difficulty swallowing / speaking Uncontrolled bleeding Significant swelling	Hypotension Chest pain
	<b>BLS:</b>	All other patients		



# Carbon Monoxide / Cyanide



## History

- Smoke inhalation
- Ingestion of cyanide
- Eating large quantity of fruit pits
- Industrial exposure
- Trauma
- Reason: Suicide, criminal, accidental
- Past Medical History
- Time / Duration of exposure

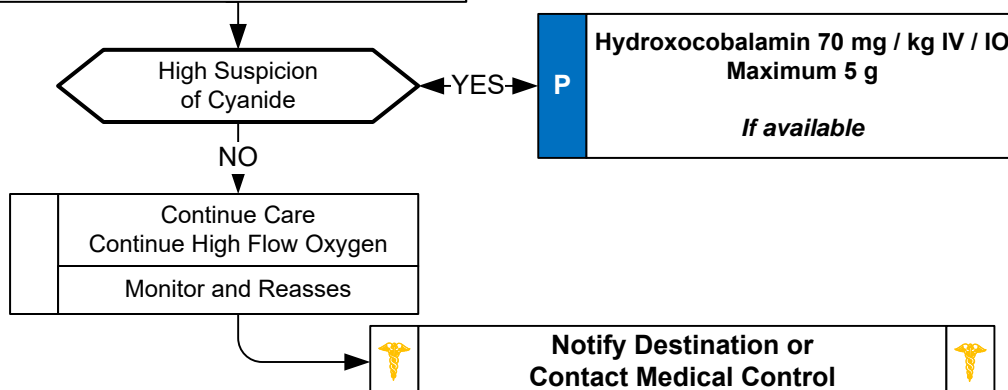
## Signs and Symptoms

- AMS
- Malaise, weakness, flu like illness
- Dyspnea
- GI Symptoms; N/V; cramping
- Dizziness
- Seizures
- Syncope
- Reddened skin
- Chest pain

## Differential

- Diabetic related
- Infection
- MI
- Anaphylaxis
- Renal failure / dialysis problem
- Head injury / trauma
- Co-ingestant or exposures

	Immediately Remove from Exposure
	Appropriate Airway Protocol(s) 1 - 7 <b>as indicated</b>
	High Flow Oxygen
	Blood Glucose Analysis Procedure
<b>B</b>	12 Lead ECG Procedure
<b>A</b>	IV/ IO Procedure
<b>P</b>	Cardiac Monitor / CO Monitor
	Altered Mental Status Protocol UP 4 <b>if indicated</b>
	Age Appropriate Diabetic Protocol AM 2 / PM 2 <b>if indicated</b>
	Age Appropriate Multiple Trauma Protocol TB 6 Head Injury TB 5 <b>if indicated</b>
	Age Appropriate Hypotension / Shock Protocol AM 5 / PM 3 <b>if indicated</b>



## Pearls

- **Recommended exam: Neuro, Skin, Heart, Lungs, Abdomen, Extremities**
- **Scene safety is priority.**
- Consider CO and Cyanide with any product of combustion
- Normal environmental CO level does not exclude CO poisoning.
- Symptoms present with lower CO levels in pregnancy, children and the elderly.
- Continue high flow oxygen regardless of pulse ox readings.

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# Drowning



## History

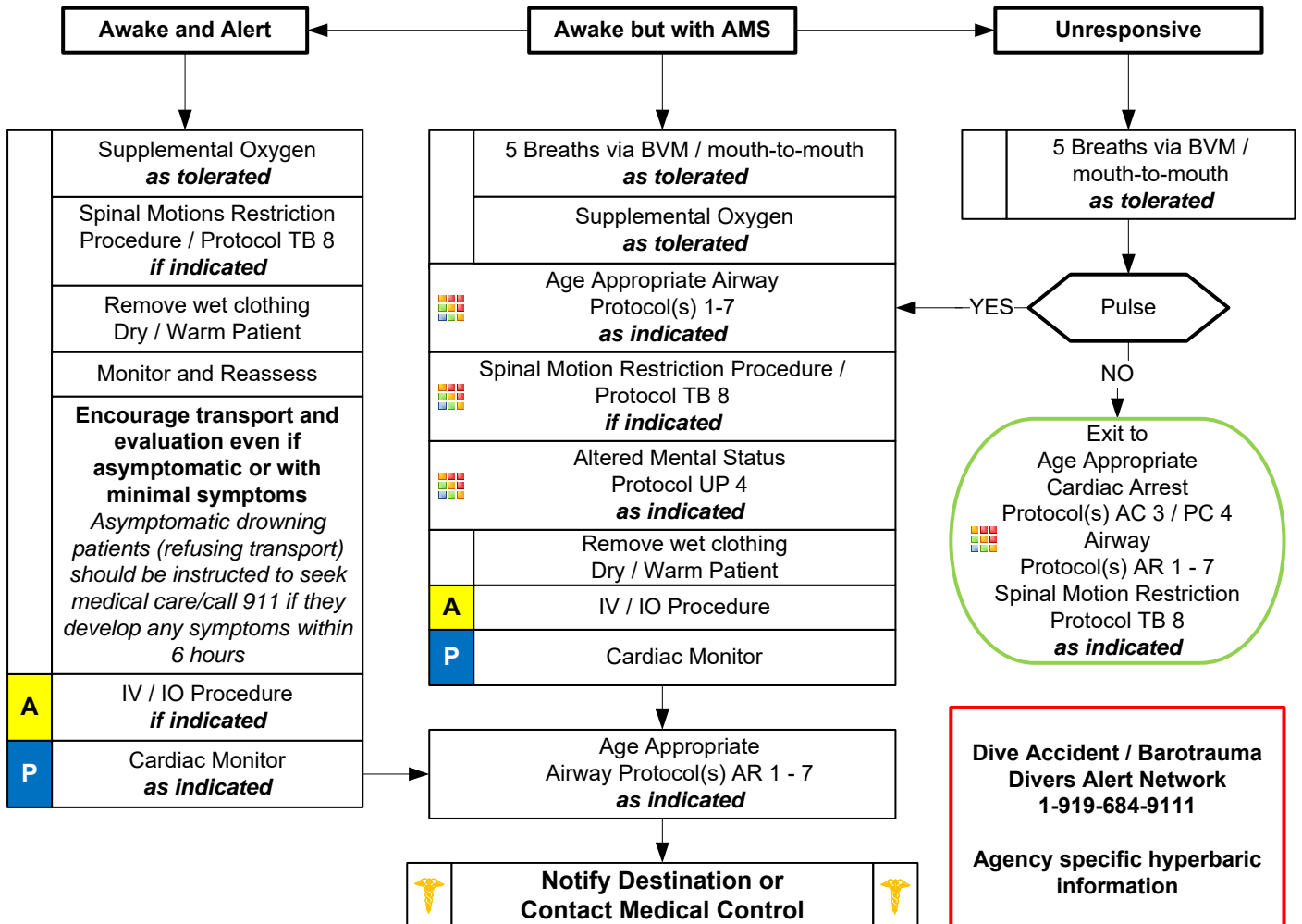
- Submersion in water regardless of depth
- Possible history of trauma  
Slammed into shore wave break
- Duration of submersion / immersion
- Temperature of water or possibility of hypothermia

## Signs and Symptoms

- Unresponsive
- Mental status changes
- Decreased or absent vital signs
- Foaming / Vomiting
- Coughing, Wheezing, Rales, Rhonchi, Stridor
- Apnea

## Differential

- Trauma
- Pre-existing medical problem  
Hypoglycemia  
Cardiac Dysrhythmia
- Pressure injury (SCUBA diving)  
Barotrauma  
Decompression sickness
- Post-immersion syndrome





# Drowning



## Pearls

- **Recommended Exam: Respiratory, Mental status, Trauma Survey, Skin, Neuro**
- **Drowning is the process of experiencing respiratory impairment (any respiratory symptom) from submersion / immersion in a liquid.**
- **Begin with BVM ventilations, if patient does not tolerate then apply appropriate mode of supplemental oxygen.**
- **Ensure scene safety. Drowning is a leading cause of death among would-be rescuers.**
- **When feasible, only appropriately trained and certified rescuers should remove patients from areas of danger.**
- **Regardless of water temperature – resuscitate all patients with known submersion time of  $\leq 25$  minutes.**
- **Regardless of water temperature – If submersion time  $\geq 1$  hour consider moving to recovery phase instead of rescue.**
- **Foam is usually present in airway and may be copious, DO NOT waste time attempting to suction. Ventilate with BVM through foam (suction water and vomit only when present.)**
- **Cardiac arrest in drowning is caused by hypoxia, airway and ventilation are equally important to high-quality CPR.**
- **Encourage transport of all symptomatic patients (cough, foam, dyspnea, abnormal lung sounds, hypoxia) due to potential worsening over the next 6 hours.**
- Predicting prognosis in prehospital setting is difficult and does not correlate with mental status. Unless obvious death, transport.
- Hypothermia is often associated with drowning and submersion injuries even with warm ambient conditions.
- Drowning patient typically has  $<1 - 3$  mL/kg of water in lungs (does not require suction) Primary treatment is reversal of hypoxia.
- Spinal motion restriction is usually unnecessary. When indicated it should not interrupt ventilation, oxygenation and / or CPR.

## Disposition:

**EMS Transport:**    **ALS:**    All patients



# Hyperthermia



## History

- Age, very young and old
- Exposure to increased temperatures and / or humidity
- Past medical history / Medications
- Time and duration of exposure
- Poor PO intake, extreme exertion
- Fatigue and / or muscle cramping

## Signs and Symptoms

- Altered mental status / coma
- Hot, dry or sweaty skin
- Hypotension or shock
- Seizures
- Nausea

## Differential

- Fever (Infection)
- Dehydration
- Medications
- Hyperthyroidism (Thyroid Storm)
- Delirium tremens (DT's)
- Heat cramps, exhaustion, stroke
- CNS lesions or tumors

**B**

Temperature Measurement Procedure  
**if available**

Temperature Measurement should NOT delay treatment of hyperthermia

Remove from heat source to cool environment
Cooling measures
Remove tight clothing
Blood Glucose Analysis Procedure
Age Appropriate Diabetic Protocol AM 2 / PM 2 <b>as indicated</b>

Assess Symptom Severity

### HEAT CRAMPS

Normal to elevated body temperature  
Warm, moist skin  
Weakness, Muscle cramping

PO Fluids as tolerated
Monitor and Reassess

### HEAT EXHAUSTION

Elevated body temperature  
Cool, moist skin  
Weakness, Anxious, Tachypnea

### HEAT STROKE

Fever, usually > 104°F (40°C)  
Hot, dry skin  
Hypotension, AMS / Coma

Age Appropriate Airway Protocol(s) AR 1 - 7 <b>as indicated</b>
Altered Mental Status Protocol UP 4 <b>as indicated</b>
Active cooling measures Target Temp < 102.5° F (39°C)
<b>B</b> 12 Lead ECG Procedure
<b>A</b> IV / IO Procedure
<b>P</b> Cardiac Monitor
<b>A</b> Normal Saline Bolus 500 mL IV / IO Repeat to effect SBP > 90 Maximum 2 L PED: Bolus 20 mL/kg IV / IO Repeat to effect Age appropriate SBP ≥ 70 + 2 x Age Maximum 60 mL/kg
Age Appropriate Hypotension / Shock Protocol AM 5 / PM 3 <b>as indicated</b>
Monitor and Reassess

Notify Destination or  
Contact Medical Control

Toxic-Environmental Protocol Section



# Hyperthermia



## Pearls

- **Recommended Exam: Mental Status, Skin, HEENT, Heart, Lungs, Neuro**
- **Extremes of age are more prone to heat emergencies (i.e. young and old). Obtain and document patient temperature if able.**
- Predisposed by use of: tricyclic antidepressants, phenothiazines, anticholinergic medications, and alcohol.
- Cocaine, Amphetamines, and Salicylates may elevate body temperatures.
- Intense shivering may occur as patient is cooled.
- **Heat Cramps:**  
Consists of benign muscle cramping secondary to dehydration and is not associated with an elevated temperature.
- **Heat Exhaustion:**  
Consists of dehydration, salt depletion, dizziness, fever, mental status changes, headache, cramping, nausea and vomiting. Vital signs usually consist of tachycardia, hypotension, and an elevated temperature.
- **Heat Stroke:**  
Consists of dehydration, tachycardia, hypotension, temperature  $\geq 104^{\circ}\text{F}$  ( $40^{\circ}\text{C}$ ), and an altered mental status.  
Sweating generally disappears as body temperature rises above  $104^{\circ}\text{F}$  ( $40^{\circ}\text{C}$ ).  
The young and elderly are more prone to be dry with no sweating.  
**Exertional Heat Stroke:**  
In exertional heat stroke (athletes, hard labor), the patient may have sweated profusely and be wet on exam.  
**Rapid cooling takes precedence over transport as early cooling decreases morbidity and mortality.**  
If available, immerse in an ice water bath for 5 – 10 minutes. Monitor rectal temperature and remove patient when temperature reaches  $102.5^{\circ}\text{F}$  ( $39^{\circ}\text{C}$ ). Your goal is to decrease rectal temperature below  $104^{\circ}\text{F}$  ( $40^{\circ}\text{C}$ ) with target of  $102.5^{\circ}\text{F}$  ( $39^{\circ}\text{C}$ ) within 30 minutes. Stirring the water aids in cooling.  
Other methods include cold wet towels below and above the body or spraying cold water over body continuously.
- **Neuroleptic Malignant Syndrome (NMS):**  
Neuroleptic Malignant Syndrome is a hyperthermic emergency which is not related to heat exposure. It occurs after taking neuroleptic antipsychotic medications.  
This is a rare but often lethal syndrome characterized by muscular rigidity, AMS, tachycardia and hyperthermia.  
**Drugs Associated with Neuroleptic Malignant Syndrome:**  
Prochlorperazine (Compazine), promethazine (Phenergan), clozapine (Clozaril), and risperidone (Risperdal) metoclopramide (Reglan), amoxapine (Ascendin), and lithium.  
**Management of NMS:**  
Supportive care with attention to hypotension and volume depletion.  
Use benzodiazepines such as diazepam or midazolam for seizures and / or muscular rigidity.

## Disposition:

<b>EMS Transport:</b>	<b>ALS:</b>	Mental Status Changes Temperature $>101^{\circ}\text{F}$ Nausea and Vomiting	Hypotension Orthostatic Changes Dehydration	Seizures Significant Dehydration Severe Cramping
	<b>BLS:</b>	Patient without above conditions and limited improvement with hydration and cooling		
<b>MD Within 4 Hours:</b>		Normal vitals signs and return to baseline with normal exam		



# Hypothermia / Frostbite



## History

- Age, very young and old
- Exposure to decreased temperatures but may occur in normal temperatures
- Past medical history / Medications
- Drug use: Alcohol, barbituates
- Infections / Sepsis
- Length of exposure / Wetness / Wind chill

## Signs and Symptoms

- Altered mental status / coma
- Cold, clammy
- Shivering
- Extremity pain or sensory abnormality
- Bradycardia
- Hypotension or shock

## Differential

- Sepsis
- Environmental exposure
- Hypothyroidism
- Hypoglycemia
- CNS dysfunction
  - Stroke
  - Head injury
  - Spinal cord injury

**B**

Temperature Measurement Procedure  
**if available**

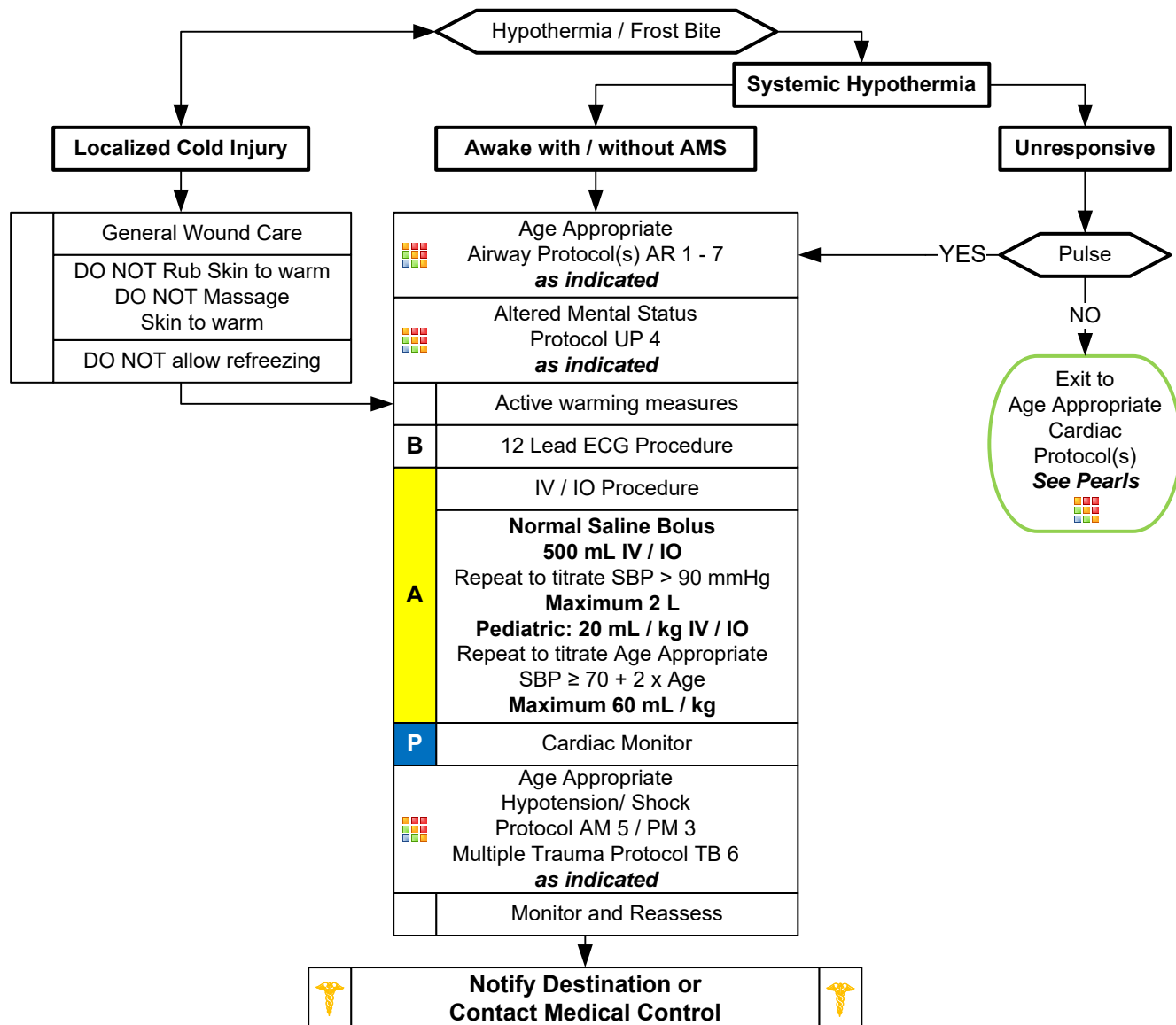
Temperature Measurement should NOT delay treatment of hypothermia

Remove wet clothing  
Dry / Warm Patient

Passive warming measures

Blood Glucose Analysis Procedure

Age Appropriate  
Diabetic Protocol AM 2 / PM 2  
**as indicated**







# Hypothermia / Frostbite



## Pearls

- **Recommended Exam: Mental Status, Heart, Lungs, Abdomen, Extremities, Neuro**
- **NO PATIENT IS DEAD UNTIL WARM AND DEAD (Body temperature  $\geq 93.2^{\circ}\text{F}$ ,  $32^{\circ}\text{C}$ .)**
- **Many thermometers do not register temperature below  $93.2^{\circ}\text{F}$ .**
- **Hypothermia categories:**
  - Mild  $90 - 95^{\circ}\text{F}$  ( $32 - 35^{\circ}\text{C}$ )
  - Moderate  $82 - 90^{\circ}\text{F}$  ( $28 - 32^{\circ}\text{C}$ )
  - Severe  $< 82^{\circ}\text{F}$  ( $< 28^{\circ}\text{C}$ )
- **Mechanisms of hypothermia:**
  - Radiation: Heat loss to surrounding objects via infrared energy ( 60% of most heat loss.)
  - Convection: Direct transfer of heat to the surrounding air.
  - Conduction: Direct transfer of heat to direct contact with cooler objects (important in submersion.)
  - Evaporation: Vaporization of water from sweat or other body water losses.
- Contributing factors of hypothermia: Extremes of age, malnutrition, alcohol or other drug use.
- If the temperature is unable to be measured, treat the patient based on the suspected temperature.
- **CPR:**
  - Severe hypothermia may cause cardiac instability and rough handling of the patient theoretically can cause ventricular fibrillation. This has not been demonstrated or confirmed by current evidence. Intubation and CPR techniques should not be withheld due to this concern.**
  - Intubation can cause ventricular fibrillation so it should be done gently by most experienced person.**
  - Below  $86^{\circ}\text{F}$  ( $30^{\circ}\text{C}$ ) antiarrhythmics may not work and if given should be given at increased intervals. Contact medical control for direction. Epinephrine / Vasopressin can be administered.**
  - Below  $86^{\circ}\text{F}$  ( $30^{\circ}\text{C}$ ) pacing should not utilized.**
  - Consider withholding CPR if patient has organized rhythm or has other signs of life. Contact Medical Control. If the patient is below  $86^{\circ}\text{F}$  ( $30^{\circ}\text{C}$ ) then defibrillate 1 time if defibrillation is required. Deferring further attempts until core warming occurs is controversial. Contact medical control for direction.**
  - Hypothermia may produce severe bradycardia so take at least 60 seconds to palpate a pulse.**
- **Active Warming:**
  - Remove from cold environment and to warm environment protected from wind and wet conditions.
  - Remove wet clothing and provide warm blankets / warming blankets.
  - Hot packs can be activated and placed in the armpit and groin area if available. Care should be taken not to place the packs directly against the patient's skin.

## Disposition:

<b>EMS Transport:</b>	<b>ALS:</b> Temperature $< 95^{\circ}\text{F}$ ( $35^{\circ}\text{C}$ ) Hypotension	Mental status change Hypoglycemia	Bradycardia
	<b>BLS:</b> All other patients		



# Marine Envenomations / Injury



## History

- Type of bite / sting
- Identification of organism
- Previous reaction to marine organism
- Immunocompromised
- Household pet

## Signs and Symptoms

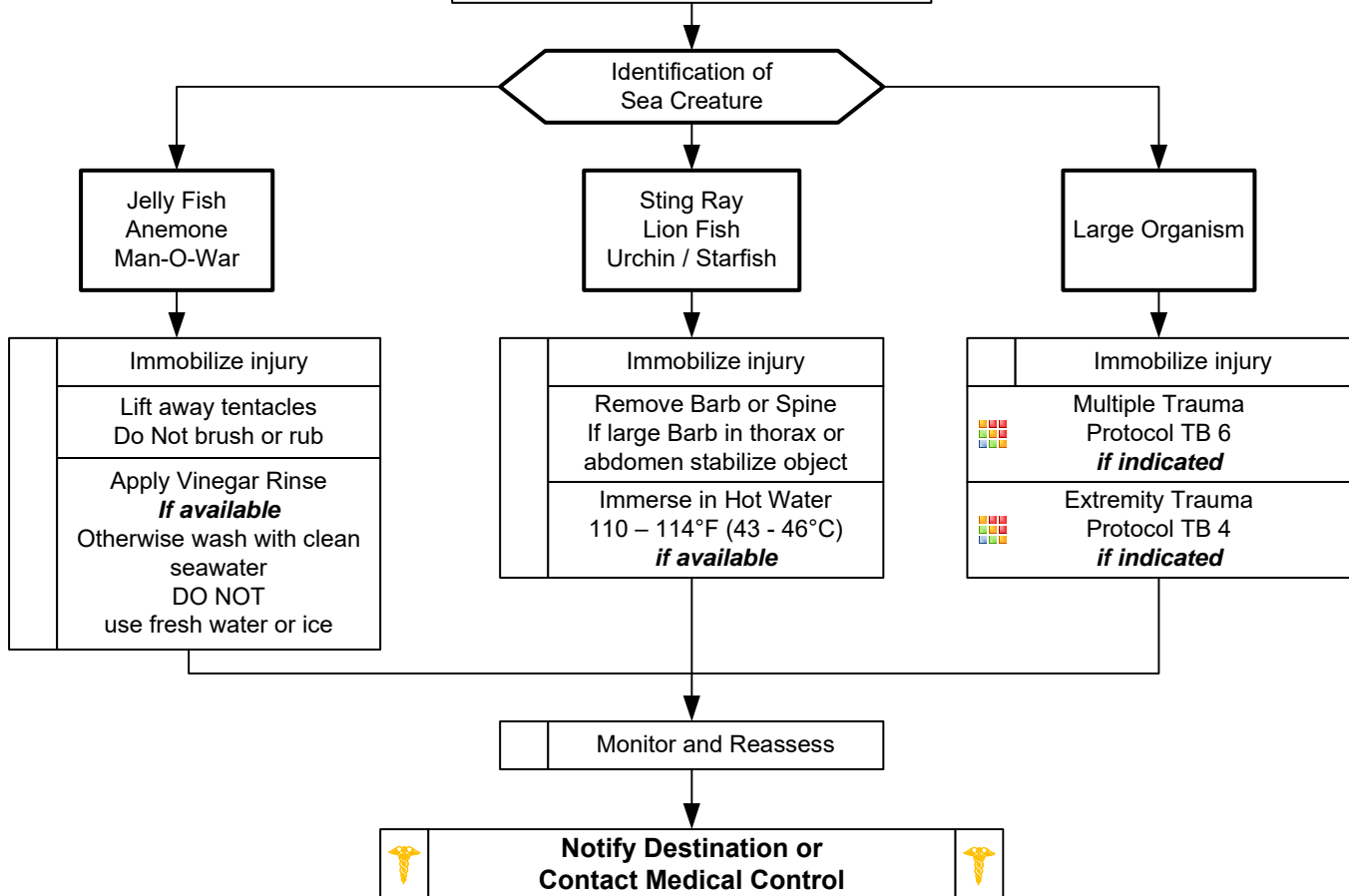
- Intense localized pain
- Increased oral secretions
- Nausea / vomiting
- Abdominal cramping
- Allergic reaction / anaphylaxis

## Differential

- Jellyfish sting
- Sea Urchin sting
- Sting ray barb
- Coral sting
- Swimmers itch
- Cone Shell sting
- Fish bite
- Lion Fish sting

	General Wound Care Procedure
A	IV / IO Procedure <i>if indicated</i>
P	Cardiac Monitor <i>if indicated</i>
	Drowning Protocol TE 3 <i>if indicated</i>
	Age Appropriate Allergy / Anaphylaxis Protocol AM 1 / PM 1 <i>if indicated</i>
	Age Appropriate Hypotension / Shock Protocol AM 5 / PM 3 <i>if indicated</i>
	Pain Control Protocol UP 11 <i>if indicated</i>

If Needed  
Carolinass Poison Control  
1-800-222-1222



Toxic-Environmental Protocol Section



# Marine Envenomations / Injury



## Pearls

- **Ensure your safety: Avoid the organism or fragments of the organism as they may impart further sting / injury.**
- **Priority is removal of the patient from the water to prevent drowning.**

### • Coral:

Coral is covered by various living organisms which are easily dislodged from the structure.

Victim may swim into coral causing small cuts and abrasions and the coral may enter to cuts causing little if any symptoms initially.

The next 24 – 48 hours may reveal an inflammatory reaction with swelling, redness, itching, tenderness and ulceration. Treatment is flushing with large amounts of fresh water or soapy water then repeating

### • Jellyfish / Anemone / Man-O-War:

Wash the area with fresh seawater to remove tentacles and nematocysts.

Do not apply fresh water or ice as this will cause nematocysts firing as well.

Recent evidence does not demonstrate a clear choice of any solution that neutralizes nematocysts.

Vinegar (immersion for 30 seconds), 50:50 mixture of Baking Soda and Seawater, and even meat tenderizer may have similar effects. Immersion in warm water for 20 minutes, 110 – 114°F (43 - 46°C), has recently been shown to be effective in pain control.

Shaving cream may be useful in removing the tentacles and nematocysts with a sharp edge (card).

Stimulation of the nematocysts by pressure or rubbing cause the nematocyst to fire even if detached from the jellyfish.

Lift away tentacles as scrapping or rubbing will cause nematocysts firing.

Typically symptoms are immediate stinging sensation on contact, intensity increases over 10 minutes.

Redness and itching usually occur.

Papules, vesicles and pustules may be noted and ulcers may form on the skin.

Increased oral secretions and gastrointestinal cramping, nausea, pain or vomiting may occur.

Muscle spasm, respiratory and cardiovascular collapse may follow.

### • Lionfish:

In North Carolina this would typically occur in the home as they are often kept as pets in saltwater aquariums.

Remove any obvious protruding spines and irrigate area with copious amounts of saline.

The venom is heat labile so immersion in hot water, 110 – 114 degrees for 30 to 90 minutes is the treatment of choice but do not delay transport if indicated.

### • Stingrays:

Typical injury is swimmer stepping on ray and muscular tail drives 1 – 4 barbs into victim.

Venom released when barb is broken.

Typical symptoms are immediate pain which increases over 1 – 2 hours. Bleeding may be profuse due to deep puncture wound.

Nausea, vomiting, diarrhea, muscle cramping and increased urination and salivation may occur.

Seizures, hypotension and respiratory or cardiovascular collapse may occur.

Irrigate wound with saline. Extract the spine or barb unless in the abdomen or thorax, contact medical control for advise. Immersion in hot water if available for 30 to 90 minutes but do not delay transport.

- Patients can suffer cardiovascular collapse from both the venom and / or anaphylaxis even in seemingly minor envenomation.
- Sea creature stings and bites impart moderate to severe pain.
- Arrest the envenomation by inactivation of the venom as appropriate.
- Ensure good wound care, immobilization and pain control.

## Disposition:

EMS Transport:	ALS:	Anaphylaxis	Rapid progression of symptoms	Hypotension
		Respiratory distress	Difficulty swallowing / speaking	Chest pain
		Uncontrolled bleeding	Calcium administered	
		SQ Epi Administered	Significant swelling	Morphine administered
		Poisonous envenomation		
	BLS:	All other patients		



# Overdose / Toxic Ingestion



## History

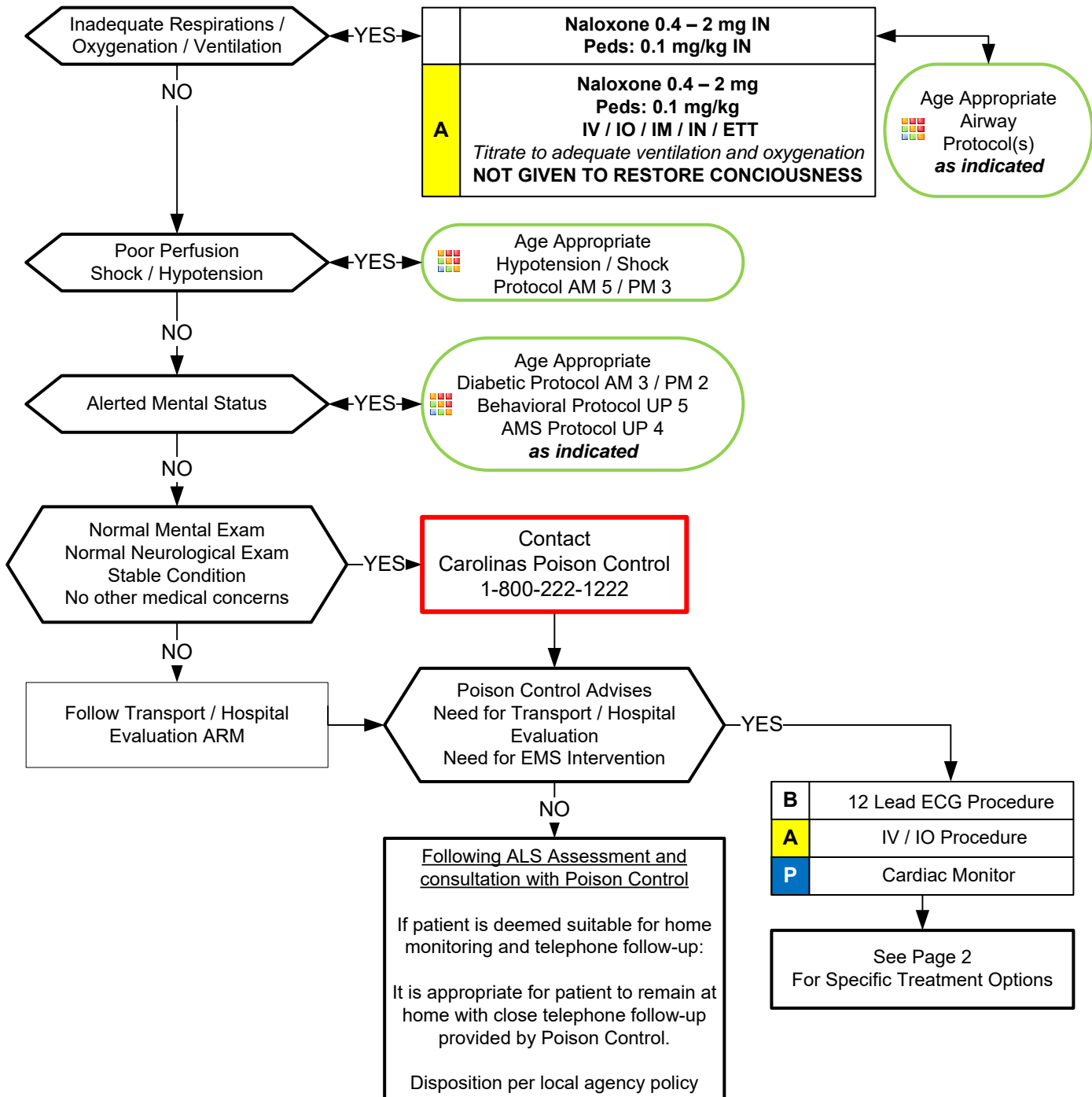
- Ingestion or suspected ingestion of a potentially toxic substance
- Substance ingested, route, quantity
- Time of ingestion
- Reason (suicidal, accidental, criminal)
- Available medications in home
- Past medical history, medications

## Signs and Symptoms

- Mental status changes
- Hypotension / hypertension
- Decreased respiratory rate
- Tachycardia, dysrhythmias
- Seizures
- S.L.U.D.G.E.
- D.U.M.B.B.E.L.S

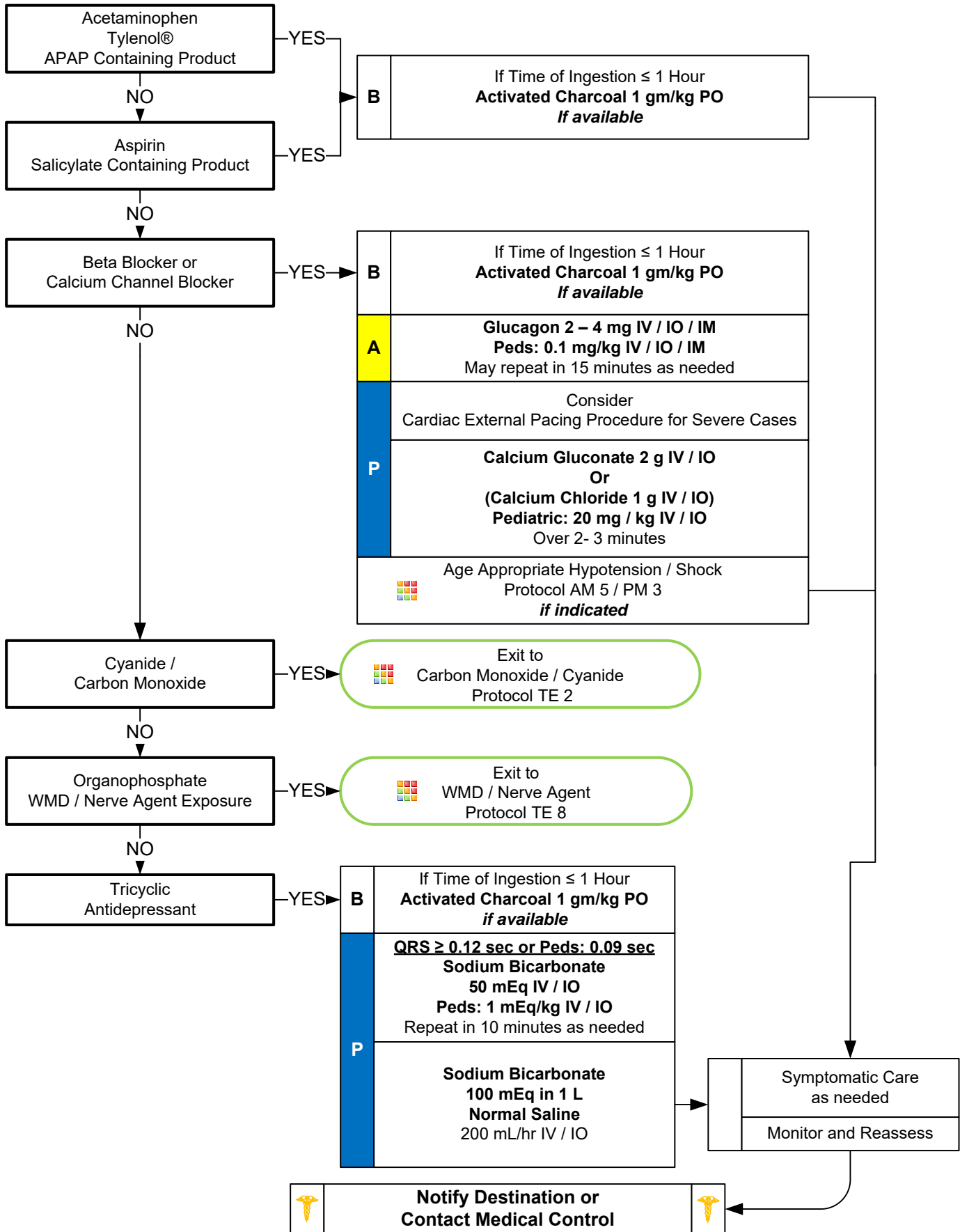
## Differential

- Tricyclic antidepressants (TCAs)
- Acetaminophen (Tylenol)
- Aspirin
- Depressants
- Stimulants
- Anticholinergic
- Cardiac medications
- Solvents, Alcohols, Cleaning agents
- Insecticides (organophosphates)





# Overdose / Toxic Ingestion



Toxin-Environmental Protocol Section



# Overdose / Toxic Ingestion



## Pearls

- **Recommended Exam: Mental Status, Skin, HEENT, Heart, Lungs, Abdomen, Extremities, Neuro**
  - **Opioids and opiates may require higher doses of Naloxone to improve respiration, in certain circumstances up to 10 mg.**
  - **Time of Ingestion:**
    1. Most important aspect is the **TIME OF INGESTION** and the substance and amount ingested and any co-ingestants.
    2. Every effort should be made to elicit this information before leaving the scene.
  - **Charcoal Administration:**

The American Academy of Clinical Toxicology **DOES NOT** recommend the routine use of charcoal in poisonings.

    1. Consider Charcoal within the **FIRST HOUR** after ingestion. If a potentially life threatening substance is ingested or extended release agent(s) are involved and  $\geq$  one hour from ingestion contact medical control or Poison Center for direction.
    2. If NG is necessary to administer Charcoal then **DO NOT** administer unless known to be adsorbed, and airway secured by intubation and ingestion is less than **ONE HOUR** confirmed and potentially lethal.
    3. Charcoal in general should only be given to a patient who is alert and awake such that they can self-administer the medication.
  - **Do not rely on patient history of ingestion, especially in suicide attempts. Make sure patient is still not carrying other medications or has any weapons.**
- Pediatric:**
- **Age specific blood pressure** 0 – 28 days > 60 mmHg, 1 month - 1 year > 70 mmHg, 1 - 10 years > 70 + (2 x age) mmHg and 11 years and older > 90 mmHg.  
**Maintenance IV Rate:** By weight of child: First 10 kg = 4 mL, Second 10 kg = 2 mL, Additional kg = 1 mL. (Example: 36 kg child: First 10 kg = 40 mL, Second 10 kg = 20 mL, 16 kg remaining at 1 mL each. Total is 76 mL / hour)
  - **Bring bottles, contents, emesis to ED.**
  - **S.L.U.D.G.E:** Salivation, Lacrimation, Urination, Defecation, GI distress, Emesis
  - **D.U.M.B.B.E.L.S:** Diarrhea, Urination, Miosis, Bradycardia, Bronchorrhea, Emesis, Lacrimation, Salivation.
  - **Tricyclic:** 4 major areas of toxicity: seizures, dysrhythmias, hypotension, decreased mental status or coma; rapid progression from alert mental status to death.
  - **Acetaminophen:** initially normal or nausea/vomiting. If not detected and treated, causes irreversible liver failure
  - **Aspirin:** Early signs consist of abdominal pain and vomiting. Tachypnea and altered mental status may occur later. Renal dysfunction, liver failure, and or cerebral edema among other things can take place later.
  - **Depressants:** decreased HR, decreased BP, decreased temperature, decreased respirations, non-specific pupils
  - **Stimulants:** increased HR, increased BP, increased temperature, dilated pupils, seizures
  - **Anticholinergic:** increased HR, increased temperature, dilated pupils, mental status changes
  - **Cardiac Medications:** dysrhythmias and mental status changes
  - **Solvents:** nausea, coughing, vomiting, and mental status changes
  - **Insecticides:** increased or decreased HR, increased secretions, nausea, vomiting, diarrhea, pinpoint pupils
  - **Nerve Agent Antidote kits** contain 2 mg of Atropine and 600 mg of pralidoxime in an autoinjector for self administration or patient care. These kits may be available as part of the domestic preparedness for Weapons of Mass Destruction.
  - **EMR and EMT may administer naloxone by IN route only and may administer from EMS supply. Agency medical director may require Contact of Medical Control prior to administration and may restrict locally.**
  - **When appropriate contact the North Carolina Poison Control Center for guidance, reference Policy 18.**
  - Consider restraints if necessary for patient's and/or personnel's protection per the Restraint Procedure.

## Disposition:

EMS Transport: All patients ALS

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# WMD-Nerve Agent Protocol



## History

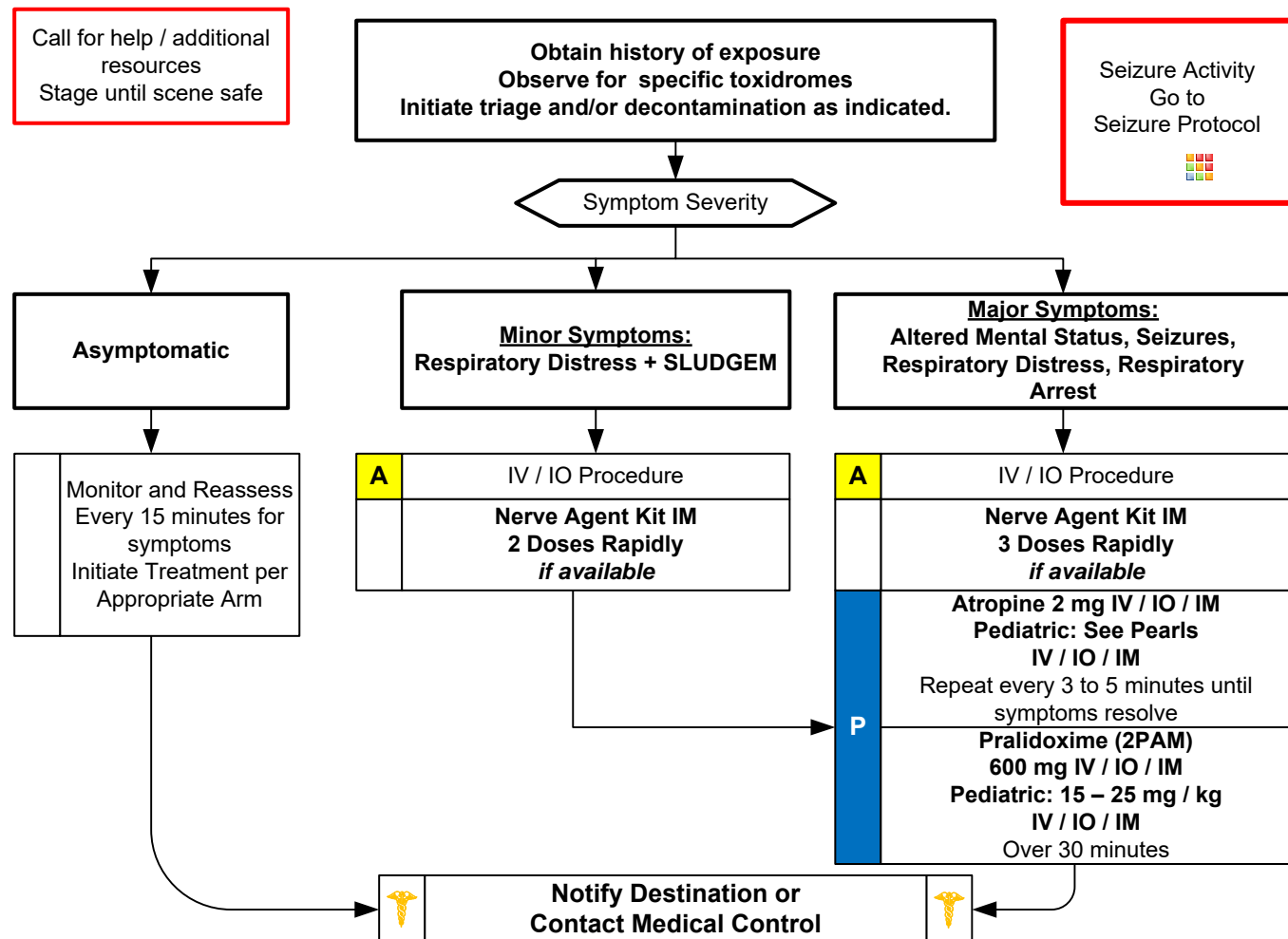
- Exposure to chemical, biologic, radiologic, or nuclear hazard
- Potential exposure to unknown substance/hazard

## Signs and Symptoms

- **S**alivation
- **L**acrimation
- **U**rination; increased, loss of control
- **D**efecation / Diarrhea
- **G**I Upset; Abdominal pain / cramping
- **E**mesis
- **M**uscle Twitching
- Seizure Activity
- Respiratory Arrest

## Differential

- Nerve agent exposure (e.g., VX, Sarin, Soman, etc.)
- Organophosphate exposure (pesticide)
- Vesicant exposure (e.g., Mustard Gas, etc.)
- Respiratory Irritant Exposure (e.g., Hydrogen Sulfide, Ammonia, Chlorine, etc.)







# WMD-Nerve Agent Protocol



## Pearls

- **Recommended Exam: Mental Status, Skin, HEENT, Heart, Lungs, Gastrointestinal, Neuro**
- **Follow local HAZMAT protocols for decontamination and use of personal protective equipment.**
- **Adult / Pediatric Atropine Dosing Guides:**
  - Confirmed attack: Begin with 1 Nerve Agent Kit for patients less than 7 years of age, 2 Nerve Agent Kits from 8 to 14 years of age, and 3 Nerve Agent Kits for patients 15 years of age and over.
  - If Triage / MCI issues exhaust supply of Nerve Agent Kits, use pediatric atropines (if available).
  - Usual pediatric doses: 0.5 mg ≤ 40 pounds (18 kg), 1 mg dose if patient weighs between 40 to 90 pounds (18 to 40 kg), and 2 mg dose ≥ 90 pounds (≥ 40 kg).
- **Each Nerve Agent Kit contains 600 mg of Pralidoxime (2-PAM) and 2 mg of Atropine. Give if available.**
- **Activity: Any benzodiazepine by any route is acceptable.**
- For patients with major symptoms, there is no limit for atropine dosing.
- Carefully evaluate patients to ensure they not from exposure to another agent (e.g., narcotics, vesicants, etc.)
- The main symptom that the atropine addresses is excessive secretions so atropine should be given until salivation improves.
- EMS personnel, public safety officers and EMR / EMT may carry, self-administer or administer to a patient atropine / pralidoxime by protocol. Agency medical director may require Contact of Medical Control prior to administration.

# Special Circumstances





# Suspected Viral Hemorrhagic Fever Ebola



## EMS Dispatch Center

1. Use Emerging Infectious Disease (EID) Surveillance Tool with the following chief complaints:  
**Typical Flu-Like Symptoms**  
and/or  
**Unexpected Bleeding**  
(not trauma or isolated nose bleed related)
2. Use EID Card (or equivalent) with the following protocols (or equivalent)  
EMD 6 Breathing Problem  
EMD 10 Chest Pain  
EMD 18 Headache  
EMD 21 Hemorrhage (medical)  
EMD 26 Sick Person
3. Ask the following:  
In the past 21 days have you been to Africa or been exposed to someone who has?  
If YES:  
Do you have a fever?

## Evolving Protocol:

Protocol subject to change at any time dependent on changing outbreak locations.

Monitor for protocol updates.

## Viral Hemorrhagic Fevers:

Ebola is one of many.

## DO NOT DISPATCH FIRST RESPONDERS

YES Dispatch EMS Unit only  
Discretely notify EMS Supervisor or command staff

NO

## EMS

**Do not rely solely on EMD personnel to identify a potential viral hemorrhagic fever patient – constrained by time and caller information**

**Obtain a travel history / exposure history and assess for clinical signs and symptoms**

## EMS Immediate Concern

1. Traveler from area with known VHR (Ebola) with or without symptoms
2. Traveler from Sierra Leone, Guinea, or Liberia within past 21 days

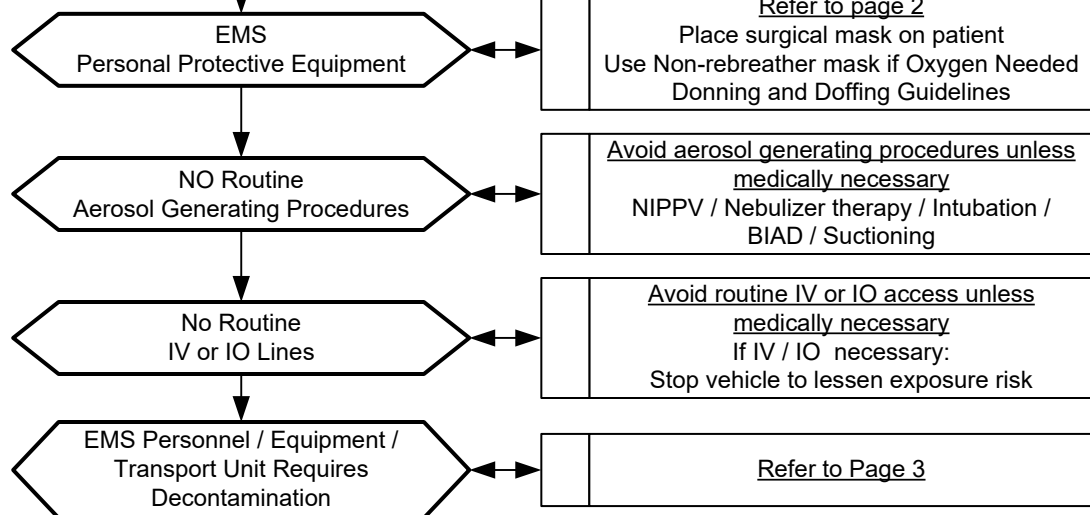
**AND**

Fever, Headache	Joint and Muscle aches	Weakness, Fatigue
Vomiting and/or Diarrhea	Abdominal Pain	Anorexia
Bleeding		

NO

Exit to  
Appropriate  
Protocol(s)

YES



Special Circumstances Section



**Notify Destination as soon and as discretely as possible**  
**DO NOT ENTER facility with patient until instructed**  
**Follow entry directions from hospital staff**





# Suspected Viral Hemorrhagic Fever Ebola



PARTICULAR ATTENTION MUST BE PAID TO PROTECTING MUCOUS MEMBRANES OF THE EYES, NOSE, and MOUTH FROM SPLASHES OF INFECTIOUS MATERIAL OR SELF INOCULATION FROM SOILED PPE / GLOVES.  
THERE SHOULD BE NO EXPOSED SKIN

**DONNING PPE:** **BEFORE** you enter the patient area.

## **Recommended PPE**

**PAPR:** A PAPR with a full face shield, helmet, or headpiece. Any reusable helmet or headpiece must be covered with a single-use (disposable) hood that extends to the shoulders and fully covers the neck and is compatible with the selected PAPR.

**N95 Respirator:** Single-use (disposable) N95 respirator in combination with single-use (disposable) surgical hood extending to shoulders and single-use (disposable) full face shield. If N95 respirators are used instead of PAPRs, careful observation is required to ensure healthcare workers are not inadvertently touching their faces under the face shield during patient care.

**Single-use (disposable) fluid-resistant or impermeable gown** that extends to at least mid-calf or coverall without integrated hood. Coveralls with or without integrated socks are acceptable.

**Single-use (disposable) nitrile examination gloves with extended cuffs.** Two pairs of gloves should be worn. At a minimum, outer gloves should have extended cuffs.

**Single-use (disposable), fluid-resistant or impermeable boot covers** that extend to at least mid-calf or single-use (disposable) shoe covers. Boot and shoe covers should allow for ease of movement and not present a slip hazard to the worker.

**Single-use (disposable) fluid-resistant or impermeable shoe covers** are acceptable only if they will be used in combination with a coverall with integrated socks.

**Single-use (disposable), fluid-resistant or impermeable apron that covers** the torso to the level of the mid-calf should be used if Ebola patients have vomiting or diarrhea. An apron provides additional protection against exposure of the front of the body to body fluids or excrement. If a PAPR will be worn, consider selecting an apron that ties behind the neck to facilitate easier removal during the doffing procedure

## **DOFFING PPE: OUTSIDE OF PPE IS CONTAMINATED! DO NOT TOUCH**

1) PPE must be carefully removed without contaminating one's eyes, mucous membranes, or clothing with potentially infectious materials.

**Use great care while doffing your PPE so as not to contaminate yourself (e.g. Do not remove your N-95 facemask or eye protection BEFORE you remove your gown). There should be a dedicated monitor to observe donning and doffing of PPE. It is very easy for personnel to contaminate themselves when doffing. A dedicated monitor should observe doffing to insure it is done correctly. Follow CDC guidance on doffing.**

2) PPE must be double bagged and placed into a regulated medical waste container and disposed of in an appropriate location.

3) Appropriate PPE must be worn while decontaminating / disinfecting EMS equipment or unit.

3) Re-useable PPE should be cleaned and disinfected according to the manufacturer's reprocessing instructions.

Hand Hygiene should be performed by washing with soap and water with hand friction for a minimum of 20 seconds.

Alcohol-based hand rubs may be used if soap and water are not available.

**EVEN IF AN ALCOHOL-BASED HAND RUB IS USED, WASH HANDS WITH SOAP AND WATER AS SOON AS FEASIBLE.**

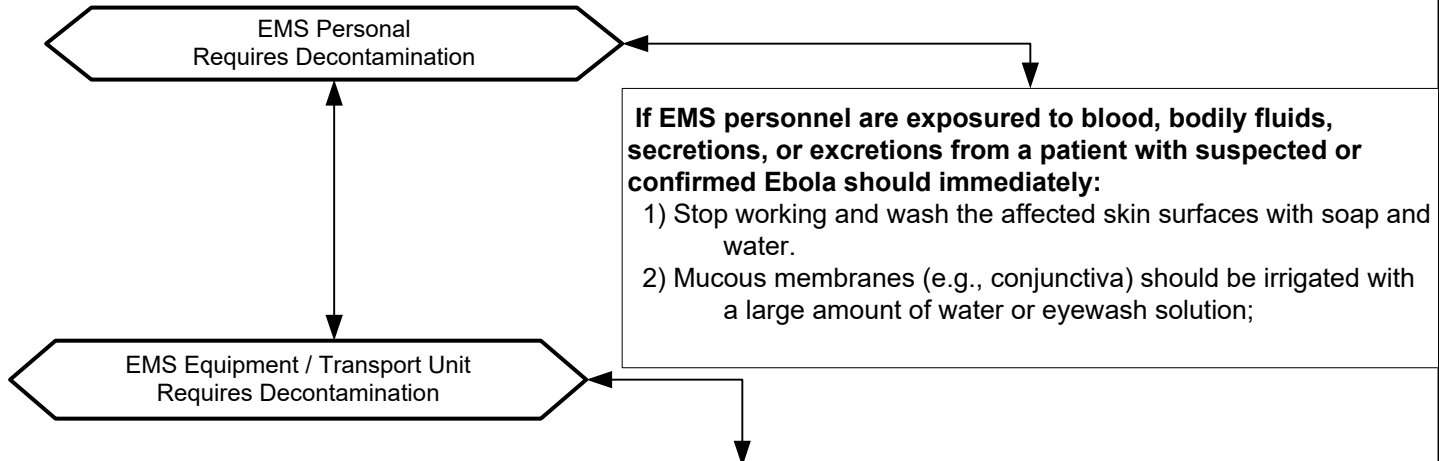
## **THE USE OF GLOVES IS NOT A SUBSTITUTE FOR HAND WASHING WITH SOAP & WATER**

For any provider exposure or contamination contact occupational health.

If the patient is being transported via stretcher then a disposable sheet can be placed over them.



# Suspected Viral Hemorrhagic Fever Ebola



- 1) EMS personnel performing decontamination / disinfection should wear recommended PPE  
**When performing Decontamination EMS Personnel MUST wear appropriate PPE, which includes:**
  - Gloves (Double glove)
  - Fluid resistant (impervious) Tyvek Like Full length (Coveralls)
  - Eye protection (Goggles)
  - N-95 face mask
  - Fluid resistant (impervious)-Head covers
  - Fluid resistant (impervious)-Shoe / Boot covers
- 2) Face protection (N-95 facemask with goggles) should be worn since tasks such as liquid waste disposal can generate splashes.
- 3) Patient-care surfaces (including stretchers, railings, medical equipment control panels, and adjacent flooring, walls and work surfaces) are likely to become contaminated and should be decontaminated and disinfected after transport.
- 4) A blood spill or spill of other body fluid or substance (e.g., feces or vomit) should be managed through removal of bulk spill matter, cleaning the site, and then disinfecting the site. For large spills, a chemical disinfectant with sufficient potency is needed to overcome the tendency of proteins in blood and other body substances to neutralize the disinfectant's active ingredient. An EPA-registered hospital disinfectant with label claims for viruses that share some technical similarities to Ebola (such as, norovirus, rotavirus, adenovirus, poliovirus) and instructions for cleaning and decontaminating surfaces or objects soiled with blood or body fluids should be used according to those instructions. (Alternatively, a 1:10 dilution of household bleach (final working concentration of 500 parts per million or 0.5% hypochlorite solution) that is prepared fresh daily (i.e., within 12 hours) can be used to treat the spill before covering with absorbent material and wiping up. After the bulk waste is wiped up, the surface should be disinfected as described in the section above).
- 5) Contaminated reusable patient care equipment should be placed in biohazard bags (double-bagged) and labeled for decontamination and disinfection.
- 6) Reusable equipment should be cleaned and disinfected according to manufacturer's instructions by appropriately trained personnel wearing correct PPE.
- 7) Avoid contamination of reusable porous surfaces that cannot be made single use. Use only a mattress and pillow with plastic or other covering that fluids cannot get through.
- 8) To reduce exposure, all potentially contaminated textiles (cloth products) should be discarded. This includes non-fluid-impermeable pillows or mattresses. They should be considered regulated medical waste and placed in biohazard red bags. They must be double-bagged prior to being placed into regulated medical waste containers.

## Pearls

- Ebola Information: **For a complete review of Ebola EMS Vehicle Disinfection go to:**  
<http://www.cdc.gov/vhf/ebola/hcp/interim-guidance-emergency-medical-services-systems-911-public-safety-answering-points-management-patients-known-suspected-united-states.html>

## Disposition:

**ALS: All patients**



# Suspected Viral Hemorrhagic Fever Ebola



Decedent Known or suspected carrier of HVF / Ebola Requires Transportation

Only personnel trained in handling infected human remains, and wearing full PPE, should touch, or move any Ebola-infected remains.  
Handling human remains should be kept to a minimum.

Donning / Doffing PPE

**PPE should be in place BEFORE contact with the body**

- 1) Prior to contact with body, postmortem care personnel must wear PPE consisting of: surgical scrub suit, surgical cap, impervious Tyvex-Coveralls, eye protection (e.g., face shield, goggles), facemask, shoe covers, and double surgical gloves.
- 2) Additional PPE (leg coverings,) might be required in certain situations (e.g., copious amounts of blood, vomit, feces, or other body fluids that can contaminate the environment).

**PPE should be removed immediately after and discarded as regulated medical waste.**

- 1) Use caution when removing PPE as to avoid contaminating the wearer.
- 2) Hand hygiene (washing your hands thoroughly with soap and water or an alcohol based hand rub) should be performed immediately following the removal of PPE. If hands are visibly soiled, use soap and water.

Preparation of Body Prior to Transport

- 1) At the site of death, the body should be wrapped in a plastic shroud. Wrapping of the body should be done in a way that prevents contamination of the outside of the shroud.
- 2) Change your gown or gloves if they become heavily contaminated with blood or body fluids.
- 3) Leave any intravenous lines or endotracheal tubes that may be present in place.
- 4) Avoid washing or cleaning the body.
- 5) After wrapping, the body should be immediately placed in a leak-proof plastic bag not less than 150  $\mu$ m thick and zippered closed. The bagged body should then be placed in another leak-proof plastic bag not less than 150  $\mu$ m thick and zippered closed before being transported to the morgue.

Surface Decontamination

- 1) Prior to transport to the morgue, perform surface decontamination of the corpse-containing body bags by removing visible soil on outer bag surfaces with EPA-registered disinfectants which can kill a wide range of viruses.
- 2) Follow the product's label instructions. Once the visible soil has been removed, reapply the disinfectant to the entire bag surface and allow to air dry.
- 3) Following the removal of the body, the patient room should be cleaned and disinfected.
- 4) Reusable equipment should be cleaned and disinfected according to standard procedures.

Transportation of VHV / Ebola Remains

PPE is required for individuals driving or riding in a vehicle carrying human remains. DO NOT handle the remains of a suspected / confirmed case of Ebola. The remains must be safely contained in a body bag where the outer surface of the body bag has been disinfected prior to the transport.

## Pearls

- Ebola Information: **For a complete review of Handling Remains of Ebola Infected Patients go to:**  
<http://www.cdc.gov/vhf/ebola/hcp/guidance-safe-handling-human-remains-ebola-patients-us-hospitals-mortuaries.html>





# Suspected Viral Hemorrhagic Fever Ebola



## Pearls

- **Transmission to another individual is the greatest after a patient develops fever. Once there is fever, the viral load in the bodily fluids appears to be very high and thus a heightened level of PPE is required.**
- **Patient contact precautions are the most important consideration.**
- **Incubation period 2-21 days**
- **Ebola must be taken seriously; however using your training, protocols, procedures and proper Personal Protective Equipment (PPE), patients can be cared for safely.**
- When an infection does occur in humans, the virus can be spread in several ways to others. The virus is spread through direct contact (through broken skin or mucous membranes) with a sick person's blood or body fluids (urine, saliva, feces, vomit, and semen) objects (such as needles) that have been contaminated with infected body fluids.
- Limit the use of needles and other sharps as much as possible. All needles and sharps should be handled with extreme care and disposed in puncture-proof, sealed containers. Safety devices must be employed immediately after use.
- Ebola Information: **For a complete review of Ebola go to:**  
<http://www.cdc.gov/vhf/ebola/index.html>  
<http://www.cdc.gov/vhf/ebola/hcp/interim-guidance-emergency-medical-services-systems-911-public-safety-answering-points-management-patients-known-suspected-united-states.html>

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# High Consequence Pathogens

## (Respiratory Diseases, SARS, MERS-CoV, Coronavirus)

### EMS Dispatch Center Screening

1. Use Emerging Infectious Disease (EID) Surveillance Tool with the following chief complaints:  
Fever Typical Flu-Like Symptoms, Respiratory Illness (cough, difficulty breathing)
2. Use EID Card (or equivalent) with the following protocols (or equivalent):  
Breathing Problem      Chest Pain      Headache      Sick Person
3. Ask the following Medical Director Approved questions:
  - Has the patient had close contact with a person being evaluated for or who has been confirmed to have Coronavirus?
  - Has the patient been in contact with anyone with flu-like symptoms? (If so, when?)
  - (Medical Facility Only) Is this an identified COVID-19 patient?
  - (Medical Facility Only) Is this transport for further evaluation of possible Coronavirus?
  - Does anyone in the residence have any flu-like symptoms?
4. Ask the following additional question:
  - Does the patient have any of the following symptoms:
    - Measured body temperature  $\geq 100.4^{\circ}\text{F}$
    - Fever (warm to the touch in room temperature)
    - Chills
    - Difficulty breathing or shortness of breath
    - Persistent cough
    - Any other new respiratory problems (e.g. persistent sneezing, wheezing, congestion)

### Evolving Protocol:

Protocol subject to change at any time dependent on changing outbreak locations.

Monitor for protocol updates.

Positive EMD Screening

### DO NOT DISPATCH FIRST RESPONDERS

- Dispatch EMS Unit only.
- Ask caller to place a mask on patient if available.
- Minimize initial responder contact when possible

Negative EMD Screening

### EMS Screening

#### Do not rely solely on EMD personnel to identify a potential exposure patient:

- EMD may be constrained by time and caller information
- First arriving provider (FR or EMS):
  - Place a surgical mask on all patients**  
Stand at a distance of  $\geq 6$  feet and perform screening questions  
Patients with Fever and/or Cough (or other respiratory symptoms are at risk of influenza and/or COVID-19).  
Chills, muscle aches, sore throat, or sudden loss of taste or smell.
  - If patient screens positive:**  
Provider dons appropriate PPE based on clinical situation
- First Responders should stage and limit number of providers entering scene only necessary to care to limit potential exposure and use of PPE.

Exit to  
Appropriate  
Protocol(s)

Negative EMS Screening

Positive EMS Screening

Place Simple/Surgical Mask  
on source patient  
(if not already worn)

EMS  
PPE

EMS  
General Treatment  
Considerations

Exit to  
Appropriate Protocol(s)

### PPE Supply Chain Disruptions:

- Prioritize Gowns to aerosol-generating procedures.

### Patient:

- Use Non-rebreather mask if Oxygen needed
- If unable to tolerate mask, have patient cover mouth and nose when coughing

### Providers utilize:

- Follow PPE precautions listed below:
- Eye protection
- N95 Mask (or higher) or PAPR for aerosol-producing treatments
- Exam Gloves
- Goggles (for aerosol-producing)
- Disposable Gown
- Create negative pressure in care compartment (See Pearls)

### Personnel in ambulance cab utilize:

- Surgical mask for driver and passenger

### Aerosol generating procedures:

(NIPPV / Nebulizer therapy / Intubation / BIAD / Suctioning) / CPR

Use all PPE devices and strategies listed above

- Notify receiving facility of infection control requirements prior to arrival.

Special Circumstances Section



# High Consequence Pathogens

## (Respiratory Diseases, SARS, MERS-CoV, Coronavirus)

### Pearls

\*\*\* Any Provider performing the initial assessment should consider wearing an N95 or higher, with goggles, to determine risk for exposure. If the patient is negative on EMS screening, utilize universal precautions, including surgical mask (or higher), and goggles for provider. All patients should be wearing a face mask during care and evaluation.\*\*\*

- **Dispatch Screening:**  
If caller interview results in positive screen this only means first responders should not be sent. Remember this screening process will result in many False Positive screens in order to be very sensitive.
- **EMS Screening:**  
Limit distance initially to  $\geq 6$  feet and one provider (when possible) should conduct a secondary screening using both the EMD specific questions and EMS specific questions. If this results in a positive screen, then ALL providers should don appropriate PPE.
- **Close Contact Definition:**  
Healthcare provider exposure is defined as being within 6 feet for  $\geq 10$  minutes in a patient with suspected illness.  
Unprotected (no or incorrect PPE) direct contact with body fluids, including respiratory generated body fluids.
- Place simple/surgical mask on ALL patients.
- **Transport:**  
Occupants in cab of vehicle all should wear at least a simple/surgical mask.  
Limit number of providers in vehicle required to provide patient care in order to limit exposures.  
Ensure use of all PPE for crew and passengers when aerosol-producing procedures utilized.
- **Negative Pressure in care compartment:**  
Door or window available to separate driver's and care compartment space:  
Close door/window between driver's and care compartment and operate rear exhaust fan on full.  
No door or window available to separate driver's and care compartment space:  
Open outside air vent in driver's compartment and set rear exhaust fan to full.  
Set vehicle ventilation system to non-recirculating to bring in maximum outside air.  
Use recirculating HEPA ventilation system if equipped.
- **Airborne precautions:**  
Standard PPE with fit-tested N95 mask (or PAPR respirator) and utilization of a gown, change of gloves after every patient contact, and strict hand washing precautions. This level is utilized with Aspergillus, SARS/MERS/COVID-19, Tuberculosis, Measles (rubeola) Chickenpox (varicella-zoster), Smallpox, Influenza, disseminated herpes zoster, or Adenovirus/Rhinovirus.
- **Contact precautions:**  
Standard PPE with utilization of a gown, change of gloves after every patient contact, and strict hand washing precautions.  
This level is utilized with GI complaints, blood or body fluids, C diff, scabies, wound and skin infections, MRSA.  
Clostridium difficile (C diff) is not inactivated by alcohol-based cleaners and washing with soap and water is indicated.
- **Droplet precautions:**  
Standard PPE plus a standard surgical mask for providers who accompany patients in the treatment compartment and a surgical mask or NRB O2 mask for the patient.  
This level is utilized when Influenza, Meningitis, Mumps, Streptococcal pharyngitis, Pertussis, Adenovirus, Rhinovirus, and undiagnosed rashes.
- **All-hazards precautions:**  
Standard PPE plus airborne precautions plus contact precautions.  
This level is utilized during the initial phases of an outbreak when the etiology of the infection is unknown or when the causative agent is found to be highly contagious (e.g. SARS, MERS-CoV, COVID-19).
- COVID-19 (Novel Coronavirus): **For most current criteria to guide evaluations of patients under investigation:**  
<http://www.cdc.gov/coronavirus/2019-nCoV/clinical-criteria.html>

### Disposition:

**EMS Transport: BLS:** Pulse O<sub>2</sub>  $>92\%$  on room air with no signs of respiratory distress, with normal mentation, ETCO<sub>2</sub>  $>26$ , and Systolic BP  $>90$ .

**ALS:** All patients that do not meet BLS Criteria



# Pandemic CPR

(Respiratory Diseases, SARS, MERS-CoV, COVID-19)



Special Considerations Protocol Section

## AT ANY TIME

Return of  
Spontaneous  
Circulation

 Go to  
Post Resuscitation  
Protocol AC 9

Criteria for Death / No Resuscitation  
Review DNR / MOST Form

YES

Decomposition  
Rigor mortis  
Dependent lividity  
Blunt force trauma  
Injury incompatible with  
life  
Extended downtime with  
asystole  
  
Do not begin  
resuscitation

NO

Don Full PPE to all Cardiac Arrest  
(gowns, gloves, goggles, and N95,  
SCBA or Particulate Respirator Mask)

## First Responders

**Begin Continuous CPR Compressions**  
**Push Hard ( $\geq 2$  inches)**  
**Push Fast (110 - 120 / min)**  
**Change Compressors every 2 minutes**  
**(sooner if fatigued)**  
**(Limit changes / pulse checks  $\leq 10$  seconds)**

If FR

Airway

If EMT

Apply Non-Rebreather at  
15 lpm

### CAUTION:

Stop compressions during placement of  
KING airway, for maximum of 30 seconds

**DO NOT PERFORM BVM VENTILATIONS**

Apply Viral Filter before ventilating

Place KING airway;  
If unable to place KING,  
then apply Non-  
Rebreather at 15 lpm

Apply Viral Filter  
to King airway

## EMS

Don Full PPE to all Cardiac Arrest  
(gowns, gloves, goggles, and N95  
or Particulate Respirator Mask)

NRB Placed by FR

Airway

KING Placed by FR

Place KING airway  
Apply Viral Filter  
(if not already  
applied)

If KING placement  
is unsuccessful,  
perform ETI

Once intubation is  
performed, attach  
viral filter and  
ETCO<sub>2</sub> Monitoring  
PRIOR to  
ventilation

### CAUTION:

Stop compressions during ETI, for maximum of 30 seconds

Minimize providers near head during intubation

If both King and ETI placement are unsuccessful, BVM  
Ventilations should be performed with an OPA and Viral Filter

Every attempt should be made to ensure a constant and tight  
mask seal to help prevent aerosolization

Apply Viral Filter and End  
Tidal Monitoring to King  
Airway, then perform  
standard ventilation

LUCAS Device should be applied EARLY to limit First Responder  
presence; once applied, First Responders should leave the  
immediate area until such time as ROSC has been achieved to  
assist in moving the patient



# Pandemic CPR

(Respiratory Diseases, SARS, MERS-CoV, COVID-19)



## Pearls

- **Team Focused Approach / Pit-Crew Approach recommended; assign responders to predetermined tasks. Refer to optional protocol or development of local agency protocol.**
- **Efforts should be directed at high quality and continuous compressions with limited interruptions and early defibrillation when indicated.**
- **DO NOT HYPERVENTILATE: If no advanced airway (BIAD, ETT) compression to ventilation ratio is 30:2. If advanced airway in place, ventilate 10 breaths per minute with continuous, uninterrupted compressions.**
- **Passive oxygenation optional in agencies practicing Team Focused Approach / Pit-Crew Approach.**
- Reassess and document BIAD and / or endotracheal tube placement and EtCO<sub>2</sub> frequently, after every move, and at transfer of care.
- **IV / IO access and drug delivery is secondary to high-quality chest compressions and early defibrillation.**
- **Defibrillation:** Follow manufacture's recommendations concerning defibrillation / cardioversion energy when specified.
- **End Tidal CO<sub>2</sub> (EtCO<sub>2</sub>)**
  - If EtCO<sub>2</sub> is < 10 mmHg, improve chest compressions.
  - If EtCO<sub>2</sub> spikes, typically > 40 mmHg, consider Return of Spontaneous Circulation (ROSC)
- **Special Considerations**
  - Maternal Arrest** - Treat mother per appropriate protocol with immediate notification to Medical Control and rapid transport preferably to obstetrical center if available and proximate. Place mother supine and perform Manual Left Uterine Displacement moving uterus to the patient's left side. IV/IO access preferably above diaphragm. Defibrillation is safe at all energy levels.
  - Renal Dialysis / Renal Failure** - Refer to Dialysis / Renal Failure protocol caveats when faced with dialysis / renal failure patient experiencing cardiac arrest.
  - Opioid Overdose** - Naloxone cannot be recommended in opioid-associated cardiac arrest. If suspected, attention to airway, oxygenation, and ventilation increase in importance. Naloxone is not associated with improved outcomes in cardiac arrest.
  - Drowning / Suffocation / Asphyxiation / Hanging / Lightning Strike** – Hypoxic associated cardiac arrest and prompt attention to airway and ventilation is priority followed by high-quality and continuous chest compressions and early defibrillation.
- **Transcutaneous Pacing:**
  - Pacing is NOT effective in cardiac arrest and pacing in cardiac arrest does NOT increase chance of survival
- Success is based on proper planning and execution. Procedures require space and patient access. Make room to work.
- Discussion with Medical Control can be a valuable tool in developing a differential diagnosis and identifying possible treatment options.

# Special Operations



# Scene Rehabilitation: General (Optional)

Injury / Illness / Complaint should be treated using appropriate treatment protocol beyond need for oral or IV hydration.



- Initial Process**
1. Personnel logged into General Rehabilitation Section
  2. VS Assessed / Recorded (If HR > 110 then obtain Temp)  
Carbon Monoxide monitoring if indicated
  3. Personnel assessed for signs / symptoms
  4. Remove PPE, Body Armor, Haz-Mat Suits, Turnout Gear, Other equipment as indicated

Significant Injury  
Cardiac Complaint: Signs / Symptoms  
Respiratory Complaint: Serious Signs / Symptoms  
Respiratory Rate < 8 or > 40  
Systolic Blood Pressure ≤ 80

Exit to  
Scene Rehabilitation  
Responder  
Protocol

NO

Heat  
or  
Cold stress

## HEAT STRESS

### Active Cooling Measures

Forearm immersion, cool shirts,  
cool mist fans etc.  
Rest 10 – 20 Minutes

### Rehydration Techniques

12 – 32 oz Oral Fluid over 20 minutes  
*Oral Rehydration may occur along with  
Active Cooling Measures*  
*Firefighters should consume 8 ounces  
of fluid between SCBA change-out*

## COLD STRESS

### Active Warming Measures

Dry responder, place in warm area  
Hot packs to axilla and / or groin  
Rest 10 – 20 minutes

### Rehydration Techniques

12 – 32 oz Oral Fluid over 20 minutes  
*Oral Rehydration may occur along with  
Active Warming Measures*  
*Firefighters should consume 8 ounces  
of fluid between SCBA change-out*

Reassess responder after 20 Minutes in  
General Rehabilitation Section  
Reassess VS

HR  
≥ 110

Temp  
≥ 100.6

Responder  
Cannot Wear  
Protective Gear

Extend  
Rehabilitation  
Time Until VS  
Improve

NO

NO

Temp  
≥ 100.6

HR  
≥ 110

Extend  
Rehabilitation  
Time Until VS  
Improve

NO

NO

Discharge Responder from  
General Rehabilitation Section  
Reports for Reassignment

## VITAL SIGN CAVEATS

### Blood Pressure:

Prone to inaccuracy on scenes. Must  
be interpreted in context.

Firefighters have elevated blood  
pressure due to physical exertion  
and is not typically pathologic.

Firefighters with Systolic BP ≥ 160 or  
Diastolic BP ≥ 100 may need  
extended rehabilitation. However this  
does not necessarily prevent them  
from returning to duty.

### Temperature:

Firefighters may have increased  
temperature during rehabilitation.

Special Operations Section



# Scene Rehabilitation: General (Optional)

## Pearls

- **This protocol is optional and given only as an example. Agencies may and are encouraged to develop their own.**
- **Rehabilitation officer has full authority in deciding when responders may return to duty and may adjust rest / rehabilitation time frames depending on existing conditions.**
- **Rehabilitation goals:**
  - Relief from climatic conditions.**
  - Rest, recovery, and hydration prior to incident, during, and following incident.**
  - Active and / or passive cooling or warming as needed for incident type and climate conditions.**
- **May be utilized with adult responders on fire, law enforcement, rescue, EMS and training scenes.**
- **Responders taking anti-histamines, blood pressure medication, diuretics or stimulants are at increased risk for cold and heat stress.**
- **General indications for rehabilitation:**
  - 20-minute rehabilitation following use of a second 30-minute SCBA, 45-minute SCBA or single 60-minute SCBA cylinder.
  - 20-minute rehabilitation following 40 minutes of intense work without SCBA.
- **General work-rest cycles:**
  - 10-minute self-rehabilitation following use of one 30-minute SCBA cylinder or performing 20 minutes of intense work without SCBA.
- **Serious signs / symptoms:**
  - Chest pain, dizziness, dyspnea, weakness, nausea, or headache.
  - Symptoms of heat stress (cramps) or cold stress.
  - Changes in gait, speech, or behavior.
  - Altered Mental Status.
  - Abnormal Vital Signs per agency SOP or Policy / Procedure.
- **Rehabilitation Section:**
  - Integral function within the Incident Management System.
  - Establish section such that it provides shelter / shade, privacy and freedom from smoke or other hazards
  - Large enough to accommodate expected number of personnel.
  - Separate area to remove PPE.
  - Accessible to EMS transport units and water supply.
  - Away from media agencies and spectators / bystanders.

# General Procedures





# Childbirth



	MR	
B	EMT	B
A	AEMT	A
P	PARAMEDIC	P

## Clinical Indications:

- Imminent delivery with crowning

## Procedure:

- Delivery should be controlled so as to allow a slow controlled delivery of the infant. This will prevent injury to the mother and infant.
- Support the infant's head as needed.
- Check the umbilical cord surrounding the neck. If it is present, slip it over the head. If unable to free the cord from the neck, double clamp the cord and cut between the clamps.
- Suction the airway with a bulb syringe.
- Grasping the head with hands over the ears, gently pull down to allow delivery of the anterior shoulder.
- Gently pull up on the head to allow delivery of the posterior shoulder.
- Slowly deliver the remainder of the infant.
- Clamp the cord 2 inches from the abdomen with 2 clamps and cut the cord between the clamps.
- Record APGAR scores at 1 and 5 minutes.
- Follow the **Newly Born Protocol** for further treatment.
- The placenta will deliver spontaneously, usually within 5 minutes of the infant. Do not force the placenta to deliver.
- Massaging the uterus may facilitate delivery of the placenta and decrease bleeding by facilitating uterine contractions.
- Continue transport to the hospital.

## Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.



# Irrigation

## Clinical Indications:

- Patient in need of irrigation for chemical exposure or limited thermal burns.

	MR	
B	EMT	B
I	EMT- I	I
P	EMT- P	P

## Procedure (chemical exposure):

1. Ensure appropriate personal protective equipment, including mask and gloves.
2. Remove as much dry chemical as possible by brushing and removing clothes.
3. While maintaining modesty and temperature of patient, flush chemical with copious water.
4. If the eyes are exposed, flush thoroughly and continuously with normal saline, flushing from the bridge of the nose outward toward the corner of the eye.
5. Monitor the patient for any possible effects of the exposure.
6. Notify ED as early as possible with chemical contaminate.

## Procedure (thermal or flame burn):

1. Determine the approximate area burned (see [appendix E](#)).
2. Cover burned areas with a clean cloth dressing.
3. If body surface area burned is less than ten percent, apply cool water or saline to the burn dressings to cool the burned area.
4. Burned patients are susceptible to hypothermia. Use caution and maintain the patient's body temperature.
5. Monitor the patient for any adverse effects or signs of hypothermia.

## Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate.

# North Carolina College of Emergency Physicians

## Standards Procedure (Skill)

### Decontamination



	MR	
B	EMT	B
I	EMT- I	I
P	EMT- P	P

#### Clinical Indications:

- Any patient who may have been exposed to significant hazardous materials, including chemical, biological, or radiological weapons.

#### Procedure:

- In coordination with HazMAT and other Emergency Management personnel, establish hot, warm and cold zones of operation.
- Ensure that personnel assigned to operate within each zone have proper personal protective equipment.
- In coordination with other public safety personnel, assure each patient from the hot zone undergoes appropriate initial decontamination. This is specific to each incident; such decontamination may include:
  - Removal of patients from Hot Zone
  - Simple removal of clothing
  - Irrigation of eyes
  - Passage through high-volume water bath (e.g., between two fire apparatus) for patients contaminated with liquids or certain solids. Patients exposed to gases, vapors, and powders often will not require this step as it may unnecessarily delay treatment and/or increase dermal absorption of the agent(s).
- Initial triage of patients should occur after step #3. Immediate life threats should be addressed prior to technical decontamination.
- Assist patients with technical decontamination (unless contraindicated based on #3 above). This may include removal of all clothing and gentle cleansing with soap and water. All body areas should be thoroughly cleansed, although overly harsh scrubbing which could break the skin should be avoided.
- Place triage identification on each patient. Match triage information with each patient's personal belongings which were removed during technical decontamination. Preserve these personnel affects for law enforcement.
- Monitor all patients for environmental illness.
- Transport patients per local protocol.

#### Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.



# Restraints: Physical

B	EMT	B
I	EMT- I	I
P	EMT- P	P

## Clinical Indications:

- Any patient who may harm himself, herself, or others may be gently restrained to prevent injury to the patient or crew. This restraint must be in a humane manner and used only as a last resort. Other means to prevent injury to the patient or crew must be attempted first. These efforts could include reality orientation, distraction techniques, or other less restrictive therapeutic means. Physical or chemical restraint should be a last resort technique.

## Procedure:

1. Attempt less restrictive means of managing the patient.
2. Request law enforcement assistance
3. Ensure that there are sufficient personnel available to physically restrain the patient safely.
4. Restrain the patient in a lateral or supine position. No devices such as backboards, splints, or other devices will be on top of the patient. The patient will never be restrained in the prone position.
5. The patient must be under constant observation by the EMS crew at all times. This includes direct visualization of the patient as well as cardiac and pulse oximetry monitoring.
6. The extremities that are restrained will have a circulation check at least every 15 minutes. The first of these checks should occur as soon after placement of the restraints as possible. This MUST be documented on the PCR.
7. Documentation on/with the patient care report (PCR) should include the reason for the use of restraints, the type of restraints used, and the time restraints were placed. Use of the Restraint Checklist is highly recommended.
8. If the above actions are unsuccessful, or if the patient is resisting the restraints, consider administering medications per protocol. (Chemical restraint may be considered earlier.)
9. If a patient is restrained by law enforcement personnel with handcuffs or other devices EMS personnel can not remove, a law enforcement officer must accompany the patient to the hospital in the transporting EMS vehicle.

## Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

# Gastric Tube Insertion

## Clinical Indications:

P

EMT- P

P

- Gastric decompression in intubated patients

## Procedure:

1. Estimate insertion length by superimposing the tube over the body from the nose to the stomach.
2. Flex the neck **if not contraindicated** to facilitate esophageal passage.
3. Liberally lubricate the distal end of the tube and pass through the patient's nostril along the floor of the nasal passage. Do not orient the tip upward into the turbinates. This increases the difficulty of the insertion and may cause bleeding.
4. In the setting of an intubated patient or a patient with facial trauma, oral insertion of the tube may be considered or preferred after securing airway.
5. Continue to advance the tube gently until the appropriate distance is reached.
6. Confirm placement by injecting 20cc of air and auscultate for the swish or bubbling of the air over the stomach. Additionally, aspirate gastric contents to confirm proper placement.
7. Secure the tube.
8. Decompress the stomach of air and food either by connecting the tube to suction or manually aspirating with the large catheter tip syringe.
9. Document the procedure, time, and result (success) on/with the patient care report (PCR).

## Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.



# Valsalva Manuever

## Clinical Indications:

Patients with supraventricular tachycardia.

P

EMT - P

P

## Procedure:

1. Oxygen and ECG monitoring must be established prior to performing Valsalva maneuvers. Emergency medications and equipment should be immediately available.
2. Record the ECG rhythm continuously while performing all vagal maneuvers.
3. Place the patient in a sitting or semi-sitting position with his or her head tilted down.
4. Instruct the patient to take a deep breath and to "bear down" as if to have a bowel movement.
5. The procedure may be repeated twice before moving to carotid sinus massage.

## Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure.

Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate.

# Airway / Respiratory Procedures







# Airway: King® Airway

B	EMT	B
I	EMT-I	I
P	EMT-P	P

## Clinical Indications for King® Airway:

- Inability to adequately ventilate a patient with a Bag Valve Mask or longer EMS transport distances require a more advanced airway.
- Appropriate intubation is impossible due to patient access or difficult airway anatomy.
- Inability to secure an endotracheal tube in a patient who does not have a gag reflex where at least one failed intubation attempt has occurred.
- Patient must be unconscious.



## Contraindications

- Responsive patients with an intact gag reflex
- Patients with known esophageal disease
- Patients who have ingested caustic substances

### Cuff Inflation by Size

Size 3 – 50 mL  
Size 4 – 70 mL  
Size 5 – 80 mL

## Procedure:

1. Preoxygenate and hyperventilate the patient.
2. Select the appropriate tube size for the patient.
3. Lubricate the tube.
4. Grasp the patient's tongue and jaw with your gloved hand and pull forward.
5. Gently insert the tube rotated laterally 45-90 degrees so that the blue orientation line is touching the corner of the mouth.
6. Once the tip is at the base of the tongue, rotate the tube back to midline. Insert the airway until the base of the connector is in line with the teeth and gums.
7. Inflate the pilot balloon with 45-90 ml of air depending on the size of the device used.
8. Ventilate the patient while gently withdrawing the airway until the patient is easily ventilated.
9. Auscultate for breath sounds and sounds over the epigastrium and look for the chest to rise and fall.
10. The large pharyngeal balloon secures the device.
11. Confirm tube placement using end-tidal CO<sub>2</sub> detector.
12. **It is strongly recommended that the airway be monitored continuously through Capnography and Pulse Oximetry.**
13. **It is strongly recommended that an Airway Evaluation Form be completed with any BIAD use.**

## Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System. Assessment should include direct observation at least once per certification cycle.





# Airway: BLS Airway

	MR	
B	EMT	B
I	EMT- I	I
P	EMT- P	P

## Clinical Indications:

- Patient with need for supplemental oxygenation, assisted ventilation, or basic airway protective measures.

## Procedure:

- Provide supplemental oxygen to patients through a device appropriate for the desired concentration of oxygen: Nasal cannula for low-concentration, partial rebreather mask for high-concentration. Set the oxygen flow to a rate designed for the delivery device: 1-6 liters per minute for nasal cannula, 8 or more liters per minute for a mask.
- Assist ventilations for patients who are not adequately ventilating themselves or who are having difficulty adequately ventilating themselves.
- Use a bag-valve-mask device with a face mask of appropriate size for the patient.
- Connect the BVM to high-flow oxygen. Rescuer one should position themselves at the patient's head.
- Hold the mask securely over the mouth and nose of the patient by compressing the mask against the face using the heel of both hands while performing a jaw thrust with the fingers of both hands.
- If assisting a spontaneously breathing patient, match your rate of ventilations to the patient's intrinsic respiratory rate.
- If ventilating a non-breathing patient, ventilate at a rate of 8-10 full ventilations per minute for an adult patient or 20 full ventilations per minute (q 3 sec) for an infant or child.
- End tidal CO<sub>2</sub> (ETCO<sub>2</sub>) monitoring, when available, should be applied whenever patients are being ventilated. Target ETCO<sub>2</sub> of 35-45.
- Protect the airway of patients that are unresponsive or have an altered level of consciousness.
- Attempt to place an appropriately sized oral airway, using an approved method of insertion. If the patient has a gag reflex, do not place the oral airway.
- Attempt to place an appropriately sized and lubricated nasal airway.

## Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate.



# Airway: CPAP

B	EMT	B
A	EMT-A	A
P	EMT- P	P

## Clinical Indications for Continuous Positive Airway Pressure (CPAP) Use:

- CPAP is indicated in spontaneously breathing adult patients (and pediatrics large enough to obtain an adequate face mask seal) in whom inadequate ventilation is suspected. This could be as a result of pulmonary edema, pneumonia, COPD, asthma, etc.

## Clinical Contraindications for Continuous Positive Airway Pressure (CPAP) Use:

- Decreased Mental Status.
- Facial features or deformities that prevent an adequate mask seal.
- Excessive respiratory secretions.

## Procedure:

1. Ensure adequate oxygen supply to ventilation device.
2. Explain the procedure to the patient.
3. Place the delivery mask over the mouth and nose. Oxygen should be flowing through the device at this point. It is preferable to roll the mask from the chin to the nose for an optimal seal, allowing the patient to hold the mask until it is in the position of comfort with psychological reassurance.
4. Adjust the forehead bar and pull the mesh cap over the patient's head. Snap the mesh cap in place, adjusting one side at a time, for comfort and to ensure minimal air leakage.
5. If the Positive End Expiratory Pressure (PEEP) is adjustable on the CPAP device adjust the PEEP to 10 cmH<sub>2</sub>O of pressure.
6. Evaluate the response of the patient assessing breath sounds, oxygen saturation, and general appearance.
7. Utilize End Tidal CO<sub>2</sub> monitoring in all patients with CPAP use.
8. If indicated by protocol, attach in-line nebulizer to provide treatment.
9. Encourage the patient to allow forced ventilation to occur. Observe closely for signs of complications. If the patient does not tolerate CPAP, consider reducing PEEP.
10. Document time and response on patient care report (PCR).

## Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.



# Airway: Cricothyrotomy-Surgical

## Clinical Indications:

P

EMT- P

P

- Failed Airway Protocol
- Management of an airway when standard airway procedures cannot be performed or have failed in a patient  $\geq 12$  years old.

## Procedure

1. Don appropriate PPE.
2. Have suction and supplies available and ready.
3. Locate the cricothyroid membrane utilizing anatomical landmarks.
4. Prep the area with an antiseptic swab (Betadine).
5. Attach a 5-cc syringe to an 18G - 1 & 1/2-inch needle.
6. Insert the needle (with syringe attached) perpendicularly through the cricothyroid membrane with the needle directed posteriorly.
7. During needle insertion, gentle aspiration should be applied to the syringe. Rapid aspiration of air into the syringe indicates successful entry into the trachea. Do not advance the needle any further. Attach forceps and remove syringe.
8. With the needle remaining in place, make a 1-inch vertical incision through the skin and subcutaneous tissue above and below the needle using a scalpel. Using blunt dissection technique, expose the cricothyroid membrane. This is a bloody procedure. The needle should act as a guide to the cricothyroid membrane.
9. With the needle still in place, make a horizontal stabbing incision approx. 1/2 inch through the membrane on each side of the needle. Remove the needle.
10. Using (skin hook, tracheal hook, or gloved finger) to maintain surgical opening, insert the cuffed tube into the trachea. (Cric tube from the kit or a #6 endotracheal tube is usually sufficient).
11. Inflate the cuff with 5-10cc of air and ventilate the patient while manually stabilizing the tube.
12. All of the standard assessment techniques for insuring tube placement should be performed (auscultation, chest rise & fall, end-tidal CO<sub>2</sub> detector, etc.) Esophageal bulb devices are not accurate with this procedure.
13. Secure the tube.
14. Apply end tidal carbon dioxide monitor (Capnography) and record readings on scene, en route to the hospital, and at the hospital.
15. Document in the patient care report ETT size, time, result (success), and placement location by the centimeter marks at the skin
16. Document all devices used to confirm initial tube placement and after each movement of the patient.
17. Consider placing an NG or OG tube to clear stomach contents after the airway is secured.
- 18. It is strongly recommended that the airway (if equipment is available) be monitored continuously through Capnography and Pulse Oximetry.**
- 19. It is strongly recommended that an Airway Evaluation Form be completed with all intubations**

## Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

# North Carolina College of Emergency Physicians

## Standards Procedure (Skill)

### Airway: Endotracheal Tube Introducer (Bougie)



#### Clinical Indications:

- Patients meet clinical indications for oral intubation
- Initial intubation attempt(s) unsuccessful
- Predicted difficult intubation

I	EMT - I	I
P	EMT - P	P

#### Contraindications:

- Three attempts at orotracheal intubation (utilize failed airway protocol)
- Age less than eight (8) or ETT size less than 6.5 mm

#### Procedure:

1. Prepare, position and oxygenate the patient with 100% oxygen;
2. Select proper ET tube without stylet, test cuff and prepare suction;
3. Lubricate the distal end and cuff of the endotracheal tube (ETT) and the distal 1/2 of the Endotracheal Tube Introducer (Bougie) (note: Failure to lubricate the Bougie and the ETT may result in being unable to pass the ETT);
4. Using laryngoscopic techniques, visualize the vocal cords if possible using Sellick's/BURP as needed;
5. Introduce the Bougie with curved tip anteriorly and visualize the tip passing the vocal cords or above the arytenoids if the cords cannot be visualized;
6. Once inserted, gently advance the Bougie until you meet resistance or "hold-up" (if you do not meet resistance you have a probable esophageal intubation and insertion should be re-attempted or the failed airway protocol implemented as indicated);
7. Withdraw the Bougie ONLY to a depth sufficient to allow loading of the ETT while maintaining proximal control of the Bougie;
8. Gently advance the Bougie and loaded ET tube until you have hold-up again, thereby assuring tracheal placement and minimizing the risk of accidental displacement of the Bougie;
9. While maintaining a firm grasp on the proximal Bougie, introduce the ET tube over the Bougie passing the tube to its appropriate depth;
10. If you are unable to advance the ETT into the trachea and the Bougie and ETT are adequately lubricated, withdraw the ETT slightly and rotate the ETT 90 degrees COUNTER clockwise to turn the bevel of the ETT posteriorly. If this technique fails to facilitate passing of the ETT you may attempt direct laryngoscopy while advancing the ETT (this will require an assistant to maintain the position of the Bougie and, if so desired, advance the ETT);
11. Once the ETT is correctly placed, hold the ET tube securely and remove the Bougie;
12. Confirm tracheal placement according to the intubation protocol, inflate the cuff with 3 to 10 cc of air, auscultate for equal breath sounds and reposition accordingly;
13. When final position is determined secure the ET tube, reassess breath sounds, apply end tidal CO2 monitor, and record and monitor readings to assure continued tracheal intubation.

#### Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System. Assessment should include direct observation at least once per certification cycle.



# Airway: Foreign Body Obstruction

	MR	
B	EMT	B
I	EMT - I	I
P	EMT - P	P

## Clinical Indications:

- Sudden onset of respiratory distress often with coughing, wheezing, gagging, or stridor due to a foreign-body obstruction of the upper airway.

## Procedure:

1. Assess the degree of foreign body obstruction
  - Do not interfere with a mild obstruction allowing the patient to clear their airway by coughing.
  - In severe foreign-body obstructions, the patient may not be able to make a sound. The victim may clutch his/her neck in the universal choking sign.
2. **For an infant**, deliver 5 back blows (slaps) followed by 5 chest thrusts repeatedly until the object is expelled or the victim becomes unresponsive.
3. **For a child**, perform a subdiaphragmatic abdominal thrust (Heimlich Maneuver) until the object is expelled or the victim becomes unresponsive.
4. **For adults**, a combination of maneuvers may be required.
  - First, subdiaphragmatic abdominal thrusts (Heimlich Maneuver) should be used in rapid sequence until the obstruction is relieved.
  - If abdominal thrusts are ineffective, chest thrusts should be used. Chest thrusts should be used primarily in morbidly obese patients and in the patients who are in the late stages of pregnancy
5. If the victim becomes unresponsive, begin CPR immediately but look in the mouth before administering any ventilations. If a foreign-body is visible, remove it.
6. **Do not perform blind finger sweeps in the mouth and posterior pharynx. This may push the object farther into the airway.**
7. In unresponsive patients, EMT-Intermediate and EMT-Paramedic level professionals should visualize the posterior pharynx with a laryngoscope to potentially identify and remove the foreign-body using Magil forceps.
8. Document the methods used and result of these procedures in the patient care report (PCR).

## Certification Requirements:

Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.



## Airway: Infant Meconium Aspiration

### Clinical Indications:

I	EMT- I	I
P	EMT- P	P

Meconium is present in the amniotic fluid of a baby being delivered and the infant is not vigorous.

### Procedure:

1. If amniotic fluid is known to contain meconium prior to delivery, prepare all equipment beforehand.
2. If meconium is discovered at the time of delivery, you must work quickly to reduce the chance of meconium aspiration syndrome.
3. If the meconium is thick (pea soup) rather than thin (watery), then the infant should be orally intubated.
4. A meconium aspirator should be attached to the endotracheal tube and connected to suction. The hole in the aspirator should be covered to apply suction to the ETT, and the ET should be slowly withdrawn from the trachea under continuous suction.
5. If the infant has been intubated and suctioned, a repeat intubation and suction with an ETT may be necessary if there is copious thick meconium present.
6. When the infant's condition is unstable, it may not be possible to clear the trachea of all meconium before positive pressure ventilation must be initiated.

### Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate.

# North Carolina College of Emergency Physicians Standards Procedure (Skill) Airway Intubation Confirmation – End-Tidal CO<sub>2</sub> Detector



B	EMT	B
I	EMT- I	I
P	EMT- P	P

## Clinical Indications:

- The End-Tidal CO<sub>2</sub> detector shall be used with any Endotracheal Tube or Blind Insertion Airway Device use.

**It is strongly recommended that continuous Capnography be used in place of or in addition to the use of an End-Tidal CO<sub>2</sub> detector.**

## Procedure:

1. Attach End-Tidal CO<sub>2</sub> detector to the Blind Insertion Airway Device or the Endotracheal Tube.
2. Note color change. A color change or CO<sub>2</sub> detection will be documented on each respiratory failure or cardiac arrest patient.
3. The CO<sub>2</sub> detector shall remain in place with the airway and monitored throughout the prehospital care and transport unless continuous Capnography is used. Any loss of CO<sub>2</sub> detection or color change is to be documented and monitored as procedures are done to verify or correct the airway problem.
4. Tube placement should be verified frequently and always with each patient move or loss of color change in the End-Tidal CO<sub>2</sub> detector.
5. Document the procedure and the results on/with the Patient Care Report (PCR) as well as on the Airway Evaluation Form.

## Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.



# North Carolina College of Emergency Physicians Standards Procedure (Skill)

## Airway: Intubation Nasotracheal



### Clinical Indications:

I	EMT - I	I
P	EMT - P	P

- A spontaneously breathing patient in need of intubation (inadequate respiratory effort, evidence of hypoxia or carbon dioxide retention, or need for airway protection).
- Rigidity or clenched teeth prohibiting other airway procedures.
- Patient must be 12 years of age or older.

### Procedure:

1. Don appropriate PPE.
2. Pre-medicate the patient with nasal spray.
3. Select the largest and least obstructed nostril and insert a lubricated nasal airway to help dilate the nasal passage.
4. Pre-oxygenate the patient. Lubricate the tube. The use of a BAAM device is recommended.
5. Remove the nasal airway and gently insert the tube keeping the bevel of the tube toward the septum.
6. Continue to pass the tube listening for air movement and looking for to and fro vapor condensation in the tube. As the tube approaches the larynx, the air movement gets louder.
7. Gently and evenly advance the tube through the glottic opening on the inspiration. This facilitates passage of the tube and reduces the incidence of trauma to the vocal cords.
8. Upon entering the trachea, the tube may cause the patient to cough, buck, strain, or gag. Do not remove the tube! This is normal, but be prepared to control the cervical spine and the patient, and be alert for vomiting.
9. Auscultate for bilaterally equal breath sounds and absence of sounds of the epigastrium. Observe for symmetrical chest expansion. The 15mm adapter usually rests close to the nostril with proper positioning.
10. Inflate the cuff with 5-10 cc of air.
11. **Confirm tube placement using end-tidal CO2 monitoring.**
12. Secure the tube.
13. Reassess airway and breath sounds after transfer to the stretcher and during transport. These tubes are easily dislodged and require close monitoring and frequent reassessment.
14. Document the procedure, time, and result (success) on/with the patient care report (PCR).
15. **It is strongly recommended that the airway (if equipment is available) be monitored continuously through Capnography and Pulse Oximetry.**
16. **It is strongly recommended that an Airway Evaluation Form be completed with all intubations**

### Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.





## Airway: Intubation Oral Tracheal

### Clinical Indications:

I	EMT- I	I
P	EMT- P	P

- Inability to adequately ventilate a patient with a Bag Valve Mask or longer EMS transport distances require a more advanced airway.
- An unconscious patient without a gag reflex who is apneic or is demonstrating inadequate respiratory effort.
- A component of Drug Assisted Intubation

### Procedure:

1. Prepare, position and oxygenate the patient with 100% Oxygen.
2. Select proper ET tube (and stylette, if used), have suction ready.
3. Using laryngoscope, visualize vocal cords. (Use Sellick maneuver/BURP to assist you).
4. Limit each intubation attempt to 30 seconds with BVM between attempts.
5. Visualize tube passing through vocal cords.
6. **Confirm and document tube placement using an end-tidal CO<sub>2</sub> monitoring.**
7. Inflate the cuff with 3-to10 cc of air; secure the tube to the patient's face.
8. Auscultate for bilaterally equal breath sounds and absence of sounds over the epigastrium. If you are unsure of placement, remove tube and ventilate patient with bag-valve mask.
9. Consider using a Blind Insertion Airway Device if intubation efforts are unsuccessful.
10. If Available apply end tidal carbon dioxide monitor (Capnography) and record readings on scene, en route to the hospital, and at the hospital.
11. Document ETT size, time, result (success), and placement location by the centimeter marks either at the patient's teeth or lips on/with the patient care report (PCR). Document all devices used to confirm initial tube placement. Also document positive or negative breath sounds before and after each movement of the patient.
12. Consider placing an NG or OG tube to clear stomach contents after the airway is secured with an ET tube.
13. **It is strongly recommended that the airway (if equipment is available) be monitored continuously through Capnography and Pulse Oximetry.**
14. **It is strongly recommended that an Airway Evaluation Form be completed with all intubations**

### Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System. Assessment should include direct observation at least once per certification cycle.

# North Carolina College of Emergency Physicians Standards Procedure (Skill)



## Airway: Video Laryngoscopy

### Clinical Indications:

P EMT - P P

- Post Resuscitation Airway Management
- Inability to adequately ventilate a patient with a Bag Valve Mask or longer EMS transport distances require a more advanced airway.
- An unconscious patient without a gag reflex who is apneic or is demonstrating inadequate respiratory effort.
- Foreign Body Airway Obstruction which cannot be visualized with a laryngoscope blade in a patient with no gag reflex.
- Any intubation attempt under the Adult, Failed Airway protocol

### Contraindications:

- Pediatric patients and/or adult patients who require less than a 6.0 Endotracheal Tube (ETT) and/or have a mouth opening less than 17mm.
- Adequate ventilation/oxygenation is provided with a BVM without assistance of an advanced airway.
- Any patient with an intact gag reflex

### Procedure:

1. Prepare, position and oxygenate the patient with 100% Oxygen.
2. Select proper ET tube have suction ready.
3. Select the appropriate size laryngoscope blade based on the size of the ETT being used.
4. Turn on the light of the Airtraq Laryngoscope blade. The laryngoscope light will blink as it is warming and then will become steady once it is ready.
5. Remove the eyepiece from the laryngoscope blade and attach the camera to the proximal end of the laryngoscope blade. The camera will automatically turn on.
6. Ensure that the ETT does not have a stylet and lubricate the ETT with surgical lubricant before placing it into the lateral channel of the laryngoscope blade.
7. Align the tip of the ETT with the end of the lateral channel being careful not obstruct the view with the distal balloon.
8. Hold the laryngoscope camera by placing the thumb on the front of the blade just below where the camera attaches. Place the index and middle finger on the back of the blade just below the Airtraq logo. This is the three finger finesse technique.
9. Insert the laryngoscope blade into the midline of the patient's mouth being careful not to insert the blade too deeply.
10. Insert the blade until the epiglottis is visualized. The blade may then be placed in the vallecula (Macintosh Style) or under the epiglottis (Miller Style).
11. Gently lift up on the laryngoscope blade to expose the vocal cords.
12. Move the laryngoscope blade to align the vocal cords in the center of the visual field. Fluids in the oropharynx can distort or obscure the visual field of the camera. To clear the visual field attempt suction, if unsuccessful follow the Adult Airway Protocol (AR-1).



## North Carolina College of Emergency Physicians Standards Procedure (Skill)



### Airway: Video Laryngoscopy

P

EMT- P

P

13. Gently advance the ETT through the lateral channel of the blade through the vocal cords and continue to advance the ETT to the appropriate depth.
14. Maintain ETT securely in position and inflate the distal balloon with 7–10ml of air.
15. Maintain ETT securely in position and remove the ETT from the lateral channel by pushing the ETT to the right corner of the mouth. Remove the blade following the midline.
16. Confirm ETT placement by auscultating for bilaterally equal breath sounds and the absence of breath sounds over the epigastrium and End-Tidal capnography waveform. If placement cannot be confirmed then remove the ETT and ventilate the patient with a bag-valve mask and follow the Adult-Failed Airway Protocol (AR-2).
- 15. Monitor the airway with continuous waveform capnography and pulse oximetry. record readings on scene, en route, to the hospital, and at the hospital.**
16. Document ETT size, time, result (success), and placement location by the centimeter marks either at the patient's teeth or lips on/with the patient care report (PCR). Document all devices used to confirm initial tube placement. Also document positive or negative breath sounds before and after each movement of the patient.
17. Consider placing an NG or OG tube to clear stomach contents after the airway is secured with an ET tube.
18. All recordings shall be saved to the appropriate location as designated by the Quality Assurance (QA) Coordinator and/or their designee. Failure to record an attempt shall be reported to the QA Coordinator and/or their designee as soon as possible.

#### Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System. Assessment should include direct observation at least once per certification cycle.

## Airway – Nebulizer Inhalation Therapy



### Clinical Indications:

- Patients experiencing bronchospasm.

B	EMT	B
I	EMT- I	I
P	EMT- P	P

### Procedure:

1. Gather the necessary equipment.
2. Assemble the nebulizer kit.
3. Instill the premixed drug (such as Albuterol or other approved drug) into the reservoir well of the nebulizer.
4. Connect the nebulizer device to oxygen at 4 - 6 liters per minute or adequate flow to produce a steady, visible mist.
5. Instruct the patient to inhale normally through the mouthpiece of the nebulizer. The patient needs to have a good lip seal around the mouthpiece.
6. The treatment should last until the solution is depleted. Tapping the reservoir well near the end of the treatment will assist in utilizing all of the solution.
7. Monitor the patient for medication effects. This should include the patient's assessment of his/her response to the treatment and reassessment of vital signs, ECG, and breath sounds.
8. Assess and document peak flows before and after nebulizer treatments.
9. Document the treatment, dose, and route on/with the patient care report (PCR).

### Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.



# Airway: Suctioning-Advanced

I	EMT- I	I
P	EMT- P	P

## Clinical Indications:

- Obstruction of the airway (secondary to secretions, blood, or any other substance) in a patient currently being assisted by an airway adjunct such as a naso-tracheal tube, endotracheal tube, Combitube, tracheostomy tube, or a cricothyrotomy tube.

## Procedure:

1. Ensure suction device is in proper working order.
2. Preoxygenate the patient as is possible.
3. Attach suction catheter to suction device, keeping sterile plastic covering over catheter.
4. Using the suprasternal notch and the end of the airway into the catheter will be placed as guides, measure the depth desired for the catheter (judgment must be used regarding the depth of suctioning with cricothyrotomy and tracheostomy tubes).
5. If applicable, remove ventilation devices from the airway.
6. With the thumb port of the catheter uncovered, insert the catheter through the airway device.
7. Once the desired depth (measured in #4 above) has been reached, occlude the thumb port and remove the suction catheter slowly.
8. A small amount of Normal Saline (10 ml) may be used if needed to loosen secretions for suctioning.
9. Reattach ventilation device (e.g., bag-valve mask) and ventilate the patient
10. Document time and result in the patient care report (PCR).

## Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.



# Airway: Suctioning-Basic

	MR	
B	EMT	B
I	EMT - I	I
P	EMT - P	P

## Clinical Indications:

- Obstruction of the airway (secondary to secretions, blood, or any other substance) in a patient who cannot maintain or keep the airway clear.

## Procedure:

1. Ensure suction device is in proper working order with suction tip in place.
2. Preoxygenate the patient as is possible.
3. Explain the procedure to the patient if they are coherent.
4. Examine the oropharynx and remove any potential foreign bodies or material which may occlude the airway if dislodged by the suction device.
5. If applicable, remove ventilation devices from the airway.
6. Use the suction device to remove any secretions, blood, or other substance.
7. The alert patient may assist with this procedure.
8. Reattach ventilation device (e.g., bag-valve mask) and ventilate or assist the patient
9. Record the time and result of the suctioning in the patient care report (PCR).

## Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.



## Airway: Tracheostomy Tube Change

### Clinical Indications:

I	EMT- I	I
P	EMT- P	P

- Presence of Tracheostomy site.
- Urgent or emergent indication to change the tube, such as obstruction that will not clear with suction, dislodgement, or inability to oxygenate/ventilate the patient without other obvious explanation.

### Procedure:

1. Have all airway equipment prepared for standard airway management, including equipment of orotracheal intubation and failed airway.
2. Have airway device (endotracheal tube or tracheostomy tube) of the same size as the tracheostomy tube currently in place as well as 0.5 size smaller available (e.g., if the patient has a #6.0 Shilley, then have a 6.0 and a 5.5 tube).
3. Lubricate the replacement tube(s) and check the cuff.
4. Remove the tracheostomy tube from mechanical ventilation devices and use a bag-valve apparatus to pre-oxygenate the patient as much as possible.
5. Once all equipment is in place, remove devices securing the tracheostomy tube, including sutures and/or supporting bandages.
6. If applicable, deflate the cuff on the tube. If unable to aspirate air with a syringe, cut the balloon off to allow the cuff to lose pressure.
7. Remove the tracheostomy tube.
8. Insert the replacement tube. Confirm placement via standard measures except for esophageal detection (which is ineffective for surgical airways).
9. If there is any difficulty placing the tube, re-attempt procedure with the smaller tube.
10. If difficulty is still encountered, use standard airway procedures such as oral bag-valve mask or endotracheal intubation (as per protocol). **More difficulty with tube changing can be anticipated for tracheostomy sites that are immature – i.e., less than two weeks old. Great caution should be exercised in attempts to change immature tracheostomy sites.**
11. Document procedure, confirmation, patient response, and any complications in the PCR

### Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System. Assessment for this skill should include direct observation at least once per certification cycle.





# Standard Procedure (Skill) Universal Care Section

## Nasopharyngeal Specimen Collection

Agency Name: \_\_\_\_\_  
 Provider Name: \_\_\_\_\_ Paramedic  
 Instructor Name: \_\_\_\_\_ EMT AEMT Paramedic Physician

SATISFACTORY ☐

UNSATISFACTORY ☐

### Instructor:

1. Evaluate providers skill performance using the check off list below.

2. Circle performance indicator.

YES = Provider completed skill with no assistance from instructor.

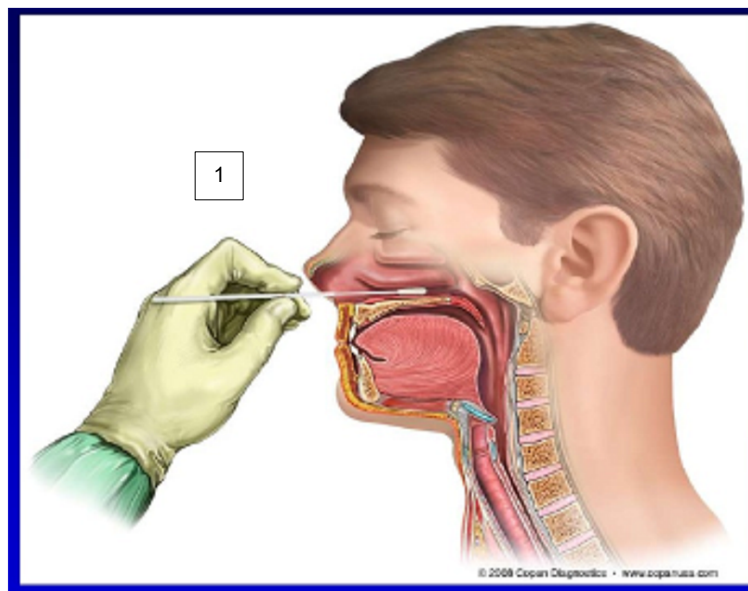
NO = Provider unable to complete skill satisfactorily following instructor intervention.

IL = Provider able to complete skill satisfactorily following Instructor Led (teaching) intervention.

Satisfactory performance indicated with  $\geq 8$  YES / IL completions. (Combination of both YES and IL)

B	Basic	B
A	Advanced	A
P	Paramedic	P

YES NO IL	Verbalizes indications for Nasopharyngeal Specimen Collection: 1. Utilization in Pandemic Non-Transport Protocol	
YES NO IL	Verbalizes contraindications: Prior History of Nasal Surgeries	
YES NO IL	Verbalizes complications: Nosebleed	
YES NO IL	Dons appropriate PPE	
YES NO IL	Instructs the patient to blow their nose into a tissue to clear excess secretions from nasal passages	
YES NO IL	Tilts the patient's head back slightly so that the nasal passages become more accessible	
YES NO IL	Instructs the patient to close their eyes to lessen the discomfort of the procedure	
YES NO IL	Gently inserts the swab along the nasal septum, directly back (not upward) and just above the floor of the nasal passage, into the nasopharynx until resistance is felt	1
YES NO IL	Rotates the swab against the nasopharyngeal mucosa for 10-15 seconds	
YES NO IL	Removes the swab, and places specimen into collection container	
YES NO IL	Labels collection container with patient information	
YES NO IL	Verbalizes coordination of collection and transport of specimen to receiving test facility	



**Instructor notes:**





# Nasopharyngeal Specimen Collection

## Clinical Information for Nasopharyngeal Specimen Collection

### **Objective of Procedure:**

Collection of Nasopharyngeal Specimen for laboratory testing

**Scope of Practice:** Paramedic, Basic, First Responder

### **Indications:**

Pandemic Non-Transport Protocol

### **Contraindications:**

Prior History of Nasal Surgeries.

### **Clinical Presentation:**

Fever  
Shortness of Breath  
Body Aches  
Cough  
Flu Like Symptoms  
GI Complaints

### **Potential Complications:**

Nosebleed

### **Procedure references:**

1. NEJM Procedure: Collection of Nasopharyngeal Specimens with the Swab Technique. (2009, November 23). Retrieved March 31, 2020, from <https://www.youtube.com/watch?v=DVJNWefmHjE>

# Assessment / Screening Procedures





# Assessment: Adult

	MR	
B	EMT	B
I	EMT- I	I
P	EMT- P	P

## Clinical Indications:

- Any patient requesting a medical evaluation that is too large to be measured with a Broselow-Luten Resuscitation Tape.

## Procedure:

- Scene size-up, including universal precautions, scene safety, environmental hazards assessment, need for additional resources, by-stander safety, and patient/caregiver interaction
- Assess need for additional resources.
- Initial assessment includes a general impression as well as the status of a patient's airway, breathing, and circulation.
- Assess mental status (e.g., AVPU) and disability (e.g., GCS).
- Control major hemorrhage and assess overall priority of patient.
- Perform a focused history and physical based on patient's chief complaint.
- Assess need for critical interventions.
- Complete critical interventions and perform a complete secondary exam to include a baseline set of vital signs as directed by protocol.
- Maintain an on-going assessment throughout transport; to include patient response/possible complications of interventions, need for additional interventions, and assessment of evolving patient complaints/conditions.
- Document all findings and information associated with the assessment, performed procedures, and any administration of medications on the PCR.

## Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

# North Carolina College of Emergency Physicians Standards Procedure (Skill)



## Pain Assessment and Documentation

### Clinical Indications:

- Any patient with pain.

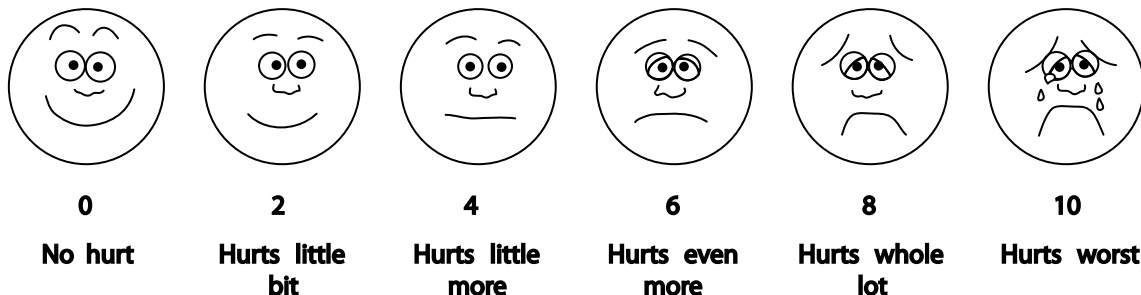
### Definitions:

- Pain is an unpleasant sensory and emotional experience associated with actual or potential tissue damage.
- Pain is subjective (whatever the patient says it is).

	MR	
B	EMT	B
I	EMT- I	I
P	EMT- P	P

### Procedure:

- Initial and ongoing assessment of pain intensity and character is accomplished through the patient's self report.
- Pain should be assessed and documented in the PCR during initial assessment, before starting pain control treatment, and with each set of vitals.
- Pain should be assessed using the appropriate approved scale.
- Three pain scales are available: the 0 – 10, the Wong - Baker "faces", and the FLACC.
  - 0 – 10 Scale: the most familiar scale used by EMS for rating pain with patients. It is primarily for adults and is based on the patient being able to express their perception of the pain as related to numbers. Avoid coaching the patient; simply ask them to rate their pain on a scale from 0 to 10, where 0 is no pain at all and 10 is the worst pain ever.
  - Wong – Baker "FACES" scale: this scale is primarily for use with pediatrics but may also be used with geriatrics or any patient with a language barrier. The faces correspond to numeric values from 0-10. This scale can be documented with the numeric value.



From Hockenberry MJ, Wilson D, Winkelstein ML: Wong's Essentials of Pediatric Nursing, ed. 7, St. Louis, 2005, p. 1259. Used with permission. Copyright, Mosby.

- FLACC scale: this scale has been validated for measuring pain in children with mild to severe cognitive impairment and in pre-verbal children (including infants).

CATEGORIES	SCORING		
	0	1	2
FACE	No particular expression or smile	Occasional grimace or frown, withdrawn, disinterested.	Frequent to constant quivering chin, clenched jaw.
LEGS	Normal position or relaxed.	Uneasy, restless, tense.	Kicking, or legs drawn up.
ACTIVITY	Lying quietly, normal position moves easily.	Squirming, shifting back and forth, tense.	Arched, rigid or jerking.
CRY	No cry, (awake or asleep)	Moans or whimpers; occasional complaint	Crying steadily, screams or sobs, frequent complaints.
CONSOLABILITY	Content, relaxed.	Reassured by occasional touching hugging or being talked to, distractable.	Difficulty to console or comfort

### Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

# North Carolina College of Emergency Physicians

## Standards Procedure (Skill)

### Assessment: Pediatric



#### Clinical Indications:

- Any child that can be measured with the Broselow-Luten Resuscitation Tape.

	MR	
B	EMT	B
I	EMT- I	I
P	EMT- P	P

#### Procedure:

- Scene size-up, including universal precautions, scene safety, environmental hazards assessment, need for additional resources, by-stander safety, and patient/caregiver interaction
- Assess patient using the pediatric triangle of ABCs:
  - Airway and appearance: speech/cry, muscle tone, inter-activeness, look/gaze, movement of extremities
  - Work of breathing: absent or abnormal airway sounds, use of accessory muscles, nasal flaring, body positioning
  - Circulation to skin: pallor, mottling, cyanosis
- Establish spinal immobilization if suspicion of spinal injury
- Establish responsiveness appropriate for age (AVPU, GCS, etc.)
- Color code using Broselow-Luten tape
- Assess disability (pulse, motor function, sensory function, pupillary response)
- Perform a focused history and physical exam. Recall that pediatric patients easily experience hypothermia and thus should not be left uncovered any longer than necessary to perform an exam.
- Record vital signs (BP > 3 years of age, cap refill < 3 years of age)
- Include Immunizations, Allergies, Medications, Past Medical History, last meal, and events leading up to injury or illness where appropriate.
- Treat chief complaint as per protocol

#### Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.



# North Carolina College of Emergency Physicians

## Standards Procedure (Skill)

### Blood Glucose Analysis



#### Clinical Indications:

- Patients with suspected hypoglycemia (diabetic emergencies, change in mental status, bizarre behavior, etc.)

	MR	
B	EMT	B
I	EMT - I	I
P	EMT - P	P

#### Procedure:

1. Gather and prepare equipment.
2. Blood samples for performing glucose analysis can be obtained through a finger-stick or when possible simultaneously with intravenous access.
3. Place correct amount of blood on reagent strip or site on glucometer per the manufacturer's instructions.
4. Time the analysis as instructed by the manufacturer.
5. Document the glucometer reading and treat the patient as indicated by the analysis and protocol.
6. Repeat glucose analysis as indicated for reassessment after treatment and as per protocol.
7. Perform Quality Assurance on glucometers at least once every 7 days, if any clinically suspicious readings are noted, and/or as recommended by the manufacturer and document in the log.

#### Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.



# North Carolina College of Emergency Physicians

## Standards Procedure (Skill)

### Pulse Oximetry



#### Clinical Indications:

- Patients with suspected hypoxemia.

#### Procedure:

	MR	
B	EMT	B
I	EMT- I	I
P	EMT- P	P

1. Apply probe to patient's finger or any other digit as recommended by the device manufacturer.
2. Allow machine to register saturation level.
3. Record time and initial saturation percent on room air if possible on/with the patient care report (PCR).
4. Verify pulse rate on machine with actual pulse of the patient.
5. Monitor critical patients continuously until arrival at the hospital. If recording a one-time reading, monitor patients for a few minutes as oxygen saturation can vary.
6. Document percent of oxygen saturation every time vital signs are recorded and in response to therapy to correct hypoxemia.
7. In general, normal saturation is 97-99%. Below 94%, suspect a respiratory compromise.
8. Use pulse oximetry as an added tool for patient evaluation. Treat the patient, not the data provided by the device.
9. The pulse oximeter reading should never be used to withhold oxygen from a patient in respiratory distress or when it is the standard of care to apply oxygen despite good pulse oximetry readings, such as chest pain. Supplemental oxygen is not required if the oxyhemoglobin saturation is  $\geq 94\%$ , unless there are obvious signs of heart failure, dyspnea, or hypoxia to maintain to 94%.
10. Factors which may reduce the reliability of the pulse oximetry reading include but are not limited to:
  - Poor peripheral circulation (blood volume, hypotension, hypothermia)
  - Excessive pulse oximeter sensor motion
  - Fingernail polish (may be removed with acetone pad)
  - Carbon monoxide bound to hemoglobin
  - Irregular heart rhythms (atrial fibrillation, SVT, etc.)
  - Jaundice
  - Placement of BP cuff on same extremity as pulse ox probe.
  - Methyhemoglobinemia

#### Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.





# North Carolina College of Emergency Physicians Standards Procedure (Skill) SpO2/CO/MET



B	EMT	B
I	EMT- I	I
P	EMT- P	P

## Clinical Indications:

- Per appropriate protocol for the non invasive monitoring of SPO2/CO/MetHgb levels

## Procedure:

1. Use a dry and appropriately sized sensor.
2. Choose a site that is well perfused (ring finger preferred).
3. Choose a site that least restricts patient movement (finger of non-dominant hand).
4. Observe all warning and cautions noted in sensor's direction for use.
5. Connect Rainbow sensor to the SpO2 port on the monitor
6. Place patient's finger in sensor until tip of finger touches the "raised digit stop".
7. Ensure sensor is secure and properly aligned with fleshy part of the digit completely covering the detector.
8. Keep sensor site at the same level as the patient's heart.
9. Press ON
10. Observe the pulse bar for fluctuations (amplitude indicates relative signal quality)
11. Confirm that SpO2 reading appears and is stable. (See Procedure 45-Pulse Oximetry)
12. For SpCO and SpMET minimize patient movement and shield the sensor from ambient light.
13. Press PRINT – SpCO and SpMET levels appear at top of printout or use SPEED DIAL to select SpO2 area and selects PARAMETER and then SpCO or SpMET
14. For any SpCO reading > 5%, always check SpMET%

## SpCO% Interpretation (carboxyhemoglobin)

0 – 5%	Normal in non-smokers
5 – 10%	Normal in smokers For non-smokers, assess for signs/symptoms, treat with high flow O2 if present
10 – 15%	(In any patient) assess for signs/symptoms, treat with high flow O2 if present
> 15%	High flow O2 X 30 minutes then reassess  If SpCO remains > 10% or if signs/symptoms are present, consider transport
> 30%, or unconscious, or pregnant	Consider immediate transport to closest hyperbaric treatment facility





# North Carolina College of Emergency Physicians Standards Procedure (Skill)



## SPO2/CO/MetHgb

### SpMET% Interpretation (methemoglobin)

0 – 3%	Normal in all patients
> 3%	Elevated MET may falsely raise SpCO levels – interpret cautiously
> 5%	If MET levels are greater than 5%, SpCO readings will not be accurate
> 10%	Clinically significant MET Assess for signs/symptoms, consult medical control for direction
> 30%	Assess for signs/symptoms, provide high flow O2, and transport

### Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanism, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate.



# North Carolina College of Emergency Physicians

## Standards Procedure (Skill)

### Stroke Screen: LA Prehospital



#### Clinical Indications:

- Suspected Stroke Patient

	MR	
B	EMT	B
I	EMT- I	I
P	EMT- P	P

#### Procedure:

1. Assess and treat suspected stroke patients as per protocol.
2. The Los Angeles Prehospital Stroke Screen (LAPSS) form should be completed for all suspected stroke patients (see appendix). There are six screening criteria items on the LAPSS form.
3. Screen the patient for the following criteria:
  - Age over 45 years
  - No history of a seizure disorder
  - New onset of symptoms in last 24 hours
  - Patient ambulatory prior to event
  - Blood glucose between 60-400
4. The final criterion consists of performing a patient exam looking for facial droop, unilateral grip weakness/absence, or unilateral arm weakness. One of these exam components must be positive to answer “yes” on the screening form.
5. **If all of the LAPSS screening criteria are met (“yes” to all criteria OR if unknown), follow the EMS System Stroke Plan and alert the receiving hospital of a possible stroke patient as early as possible.**
6. All sections of the LAPSS form must be completed.
7. The completed LAPSS form should be attached or documented in the PCR.

#### Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.



# North Carolina College of Emergency Physicians

## Standards Procedure (Skill)

### Temperature Measurement



#### Clinical Indications:

	MR	
B	EMT	B
I	EMT- I	I
P	EMT- P	P

- Monitoring body temperature in a patient with suspected infection, hypothermia, hyperthermia, or to assist in evaluating resuscitation efforts.

#### Procedure:

- For adult patients that are conscious, cooperative, and in no respiratory distress, an oral temperature is preferred (steps 2 to 4 below). For infants or adults that do not meet the criteria above, a rectal temperature is preferred (steps 5 to 7 below).
- To obtain an oral temperature, ensure the patient has no significant oral trauma and place the thermometer under the patient's tongue with appropriate sterile covering.
- Have the patient seal their mouth closed around thermometer.
- If using an electric thermometer, leave the device in place until there is indication an accurate temperature has been recorded (per the "beep" or other indicator specific to the device). If using a traditional thermometer, leave it in place until there is no change in the reading for at least 30 seconds (usually 2 to 3 minutes). Proceed to step 8.
- Prior to obtaining a rectal temperature, assess whether the patient has suffered any rectal trauma by history and/or brief examination as appropriate for patient's complaint.
- To obtain a rectal temperature, cover the thermometer with an appropriate sterile cover, apply lubricant, and insert into rectum no more than 1 to 2 cm beyond the external anal sphincter.
- Follow guidelines in step 5 above to obtain temperature.
- Record time, temperature, method (oral, rectal), and scale (C° or F°) in Patient Care Report (PCR).

#### Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.



# North Carolina College of Emergency Physicians

## Standards Procedure (Skill)

### Vital Signs



#### Clinical Indications:

- Patient needing evaluation of vital signs.

#### Procedure:

	MR	
B	EMT	B
I	EMT- I	I
P	EMT- P	P

1. If automated vital sign readings seem inconsistent with the patient's clinical \ presentation, manual assessment of vital signs should be conducted.
2. **Pulse rate:** Palpate the pulse rate at a convenient site by compressing the relevant artery against an underlying bone and counting the number of pulses in a fifteen or thirty second period. Multiply the count by either four (for fifteen seconds) or two (for thirty seconds) to determine the pulse rate (per minute).
3. **Respiratory rate:** Count the number of respirations in a thirty second period. Do not make the patient aware that you are observing their breathing, as this may cause the patient to alter their breathing rate or effort. Watch for subtle changes in neck muscles if chest rise and fall cannot be easily seen. Multiply the count of respirations in the thirty second period by two to determine the respiratory rate.
4. **Blood pressure:** Use an appropriately sized blood pressure cuff and a stethoscope to auscultate a blood pressure in the brachial artery. Apply the cuff above the elbow with the center of the bladder over the artery. Hold the stethoscope head over the artery just below the cuff. Inflate the cuff to 20mm Hg above the pressure at which you stop hearing beats. Slowly deflate the cuff, noting the pressure at which you first hear beats (systolic) and the pressure at which the beats disappear (diastolic). In an urgent situation, a blood pressure may be palpated or estimated based on the presence of palpable pulses.
5. **Pulse Oximetry:** (see [ASP5](#))
6. **GCS:** Mandatory for all patients
7. **Capnography:** (see [ASP12](#))
8. **Temperature:** (see [ASP8](#))
9. **Broselow Color:** In pediatric patients, measure the length of the patient from the indicated end of the Broselow pediatric tape. Place the arrow end at one end of the patient, and read the color code at the other end of the patient.

#### Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate.

# North Carolina College of Emergency Physicians

## Standards Procedure (Skill)

### Orthostatic Blood Pressure Measurement



#### Clinical Indications:

	MR	
B	EMT	B
I	EMT- I	I
P	EMT- P	P

- Patient situations with suspected blood, fluid loss, or dehydration with no indication for spinal immobilization. Orthostatic vital signs are not routinely recommended.
- Patients  $\geq 8$  years of age, or patients larger than the Broselow-Luten tape

#### Procedure:

1. Gather and prepare standard sphygmomanometer and stethoscope.
2. With the patient supine, obtain pulse and blood pressure.
3. If possible have the patient stand.
4. After one minute, obtain blood pressure and pulse.
5. If the systolic blood pressure falls more than 20 mmHg or the pulse rises more than 20 bpm, the patient is considered to be orthostatic.
6. If a patient experiences dizziness upon sitting or is obviously dehydrated based on history or physical exam, formal orthostatic examination should be omitted and fluid resuscitation initiated.

#### Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.



# North Carolina College of Emergency Physicians Standards Procedure (Skill)



## Reperfusion Checklist

### Clinical Indications:

Rapid evaluation of a patient with suspected acute stroke and/or acute myocardial infarction (STEMI) to:

- Determine eligibility and potential benefit from fibrinolysis..
- Rapid identification of patients who are not eligible for fibrinolysis and will require interventional therapy.

	MR	
B	EMT	B
I	EMT- I	I
P	EMT- P	P

### Procedure:

1. Follow the appropriate protocol for the patient's complaint to assess and identify an acute condition which could potentially benefit from fibrinolysis. If a positive finding is noted on one of the following assessments, proceed to step 2.
  - Perform a 12-lead ECG to identify an acute ST elevation myocardial infarction (STEMI).
  - Perform the Los Angeles Pre-hospital Stroke Screen to identify an acute stroke
2. Complete the Reperfusion Check Sheet to identify any potential contraindications to fibrinolysis. (See Appendix)
  - Systolic Blood Pressure greater than 180 mm Hg
  - Diastolic Blood Pressure greater than 110 mm Hg
  - Right vs. Left Arm Systolic Blood Pressure difference of greater than 15 mm Hg
  - History of structural Central Nervous System disease (age  $\geq$  18, history of aneurysm or AV-malformation, tumors, masses, hemorrhage, etc.)
  - Significant closed head or facial trauma within the previous 3 months
  - Recent (within 6 weeks) major trauma, surgery (including laser eye surgery), gastrointestinal bleeding, or severe genital-urinary bleeding
  - Bleeding or clotting problem or on blood thinners
  - CPR performed greater than 10 minutes
  - Currently Pregnant
  - Serious Systemic Disease such as advanced/terminal cancer or severe liver or kidney failure.
3. Identify if the patient is currently in heart failure or cardiogenic shock. For these patients, a percutaneous coronary intervention is more effective.
  - Presence of pulmonary edema (rales greater than halfway up lung fields)
  - Systemic hypoperfusion (cool and clammy)
4. If any contraindication is noted using the check list and an acute Stroke is suspected by exam or a STEMI is confirmed by ECG, activate the EMS Stroke Plan or EMS STEMI Plan for fibrinolytic ineligible patients. This may require the EMS Agency, an Air Medical Service, or a Specialty Care Transport Service to transport directly to a specialty center capable of interventional care within the therapeutic window of time.
5. Record all findings in the Patient Care Report (PCR).

### Certification Requirements:

Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.



# North Carolina College of Emergency Physicians Standards Procedure (Skill) Capnography



B	EMT	B
I	EMT- I	I
P	EMT- P	P

## Clinical Indications:

- Capnography shall be used when available with the use of all invasive airway procedure including endotracheal, nasotracheal, cricothyrotomy, or Blind Insertion Airway Devices (BIAD).
- Capnography should also be used when possible with CPAP.

## Procedure:

1. Attach capnography sensor to the BIAD, endotracheal tube, or oxygen delivery device.
2. Note CO<sub>2</sub> level and waveform changes. These will be documented on each respiratory failure, cardiac arrest, or respiratory distress patient.
3. The capnometer shall remain in place with the airway and be monitored throughout the prehospital care and transport.
4. Any loss of CO<sub>2</sub> detection or waveform indicates an airway problem and should be documented.
5. The capnogram should be monitored as procedures are performed to verify or correct the airway problem.
6. Document the procedure and results on/with the Patient Care Report (PCR) and the Airway Evaluation Form.

## Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.



# North Carolina College of Emergency Physicians

## Standards Procedure (Skill)

### Assessment: Capacity



#### Clinical Indications:

	MR	
B	EMT	B
I	EMT- I	I
P	EMT- P	P

- If an individual (or the parent or legal guardian of the individual) refuses secondary care and/or ambulance transport to a hospital after prehospital providers have been called to the scene, providers should determine the patient's capacity to make decisions. Competency is generally a legal status of a person's ability to make decisions.

#### Procedure:

- For any patient that is refusing medical care or transport, a capacity exam should be performed.
- Assess if the patient is oriented to: **Person, Place, Time** and **Event**
- Perform CRAM assessment:
  - Can the individual **C**ommunicate a clear choice?
  - Is **R**elevant information understood?
  - Is there an **A**ppreciation of the situation?
    - In other words, does the person understand what is wrong, and the implications for their medical decisions (If I don't go, I may die...)
  - Can they **M**anipulate the information in a rational manner?
    - In other words, can they use the information provided to make a rational decision
- Key questions to ask patient:
  - Ask** them to echo back the information you provide, including:
    - The lack of a complete evaluation
    - The risks of undiagnosed illness
  - Can they believe the information provided?
    - **Ask** them to state in their own words your concerns about their medical conditions and the possible consequences of refusing
  - Can they use the information to make a choice?
    - **Ask** them to state in their own words their reason for refusing care despite your recommendations
- An individual determined to lack decision-making capacity by EMS providers **should not be allowed to refused care** against medical advise or to be released at the scene.
- If there are any questions about your patient's capacity, contact your Supervisor and/or Online Medical Control.

**NOTE:** The individual's judgment must also not be significantly impaired by illness, injury, or drugs / alcohol intoxication. Individuals who have attempted suicide, verbalized suicidal intent, or have other factors that lead EMS providers to suspect suicidal intent, should not be regarded as having decision-making capacity and **may not** decline transport to a medical facility.



# Medication Administration Procedures





# North Carolina College of Emergency Physicians

## Standards Procedure (Skill)

### Medication Administration Cross Check (MACC)



#### Clinical Indications:

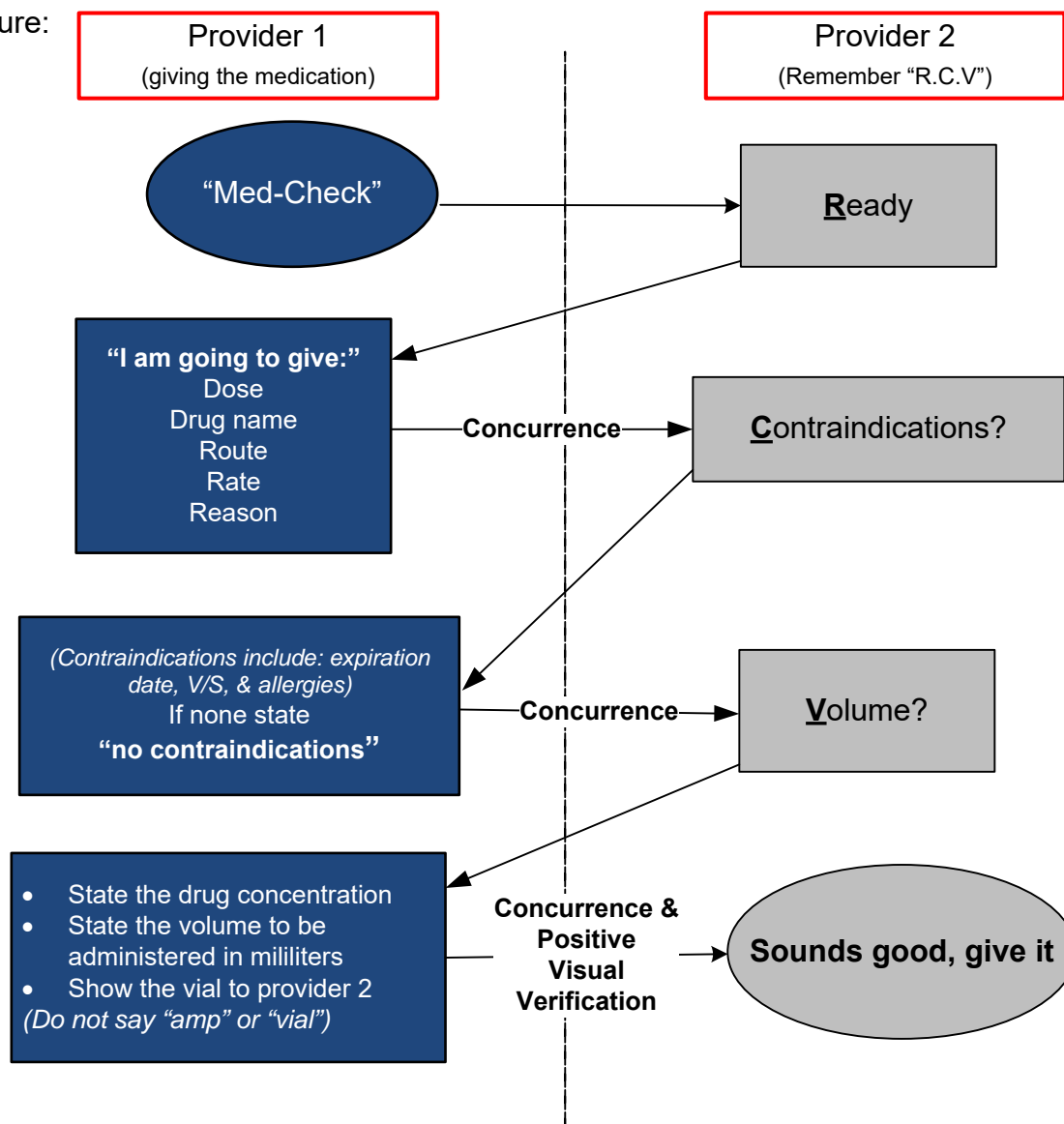
Any patient needing medication administration

#### Contraindication:

None

LE	Law Enforcement	LE
	MR	
B	EMT	B
I	EMT- I	I
P	EMT- P	P

#### Procedure:



#### Certification Requirements:

Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanism, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate.



# North Carolina College of Emergency Physicians

## Standards Procedure (Skill)

### Medication Administration: Intranasal



LE	Law Enforcement	LE
	MR	
B	EMT	B
I	EMT - I	I
P	EMT - P	P

#### Clinical Indications:

- Patient needing medication administration when the specific medication must be given via the intranasal route or as an alternative route in selected medications.

#### Contraindication:

- Lack of a nose
- Destruction of nasal mucosa from surgery or cocaine abuse



#### Procedure:

1. Confirm the correct medication, expiration date, and dosage. Read the label to verify the drug is intended for nasal administration (okay if labeled for intravenous use). Check to see if the dose to be administered is dependent upon the patient's weight or other variable factors.
2. Assess the patient to be sure they are not allergic to the drug.
3. Recheck the order/dose for milliliters and verify that you have correctly calculated and drawn up the appropriate volume dose.
4. Attach the MAD (Mucosal Atomizer Device) nasal atomizer.
5. Place the atomizer 1.5 cm into the patient's nostril.
6. Briskly compress the syringe to administer  $\frac{1}{2}$  of the medication.
7. Remove and repeat into the other nostril until all of the medication has been administered.
8. Volumes greater than 1ml are too large and will lead to failure because the drug cannot be absorbed by the nasal mucosa quickly enough.
9. Factors that negatively affect mucosal absorption of medication may include recent use of vasoconstrictors, i.e. cocaine or afrin, epistaxis, nasal congestion and/or discharge.
10. Monitor the patient for the desired therapeutic effects as well as any possible side effects.

#### Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanism, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate.



# North Carolina College of Emergency Physicians Standards Procedure (Skill)



## Medication Administration: Intravenous and Intraosseous

### Clinical Indications:

I	EMT- I	I
P	EMT- P	P

- Patient in need of medication which should be given intravenously.

### Procedure:

1. Confirm the correct medication, expiration date, and dosage. Read the label to verify the drug is intended for intravenous administration. Check to see if the dose to be administered is dependent upon the patient's weight or other variable factors.
2. Assess the patient to be sure they are not allergic to the drug.
3. Recheck the order / dose for milliliters and verify that you have correctly calculated and drawn up the appropriate volume dose.
4. Assure patency of IV
5. Cleanse the port w/ an alcohol prep pad if sterility is in question.
6. Insert the needle or needleless device into the injection port.
7. Pinch the IV tubing above the injection port and push the syringe plunger to inject the correct volume of medication into the tubing while observing for infiltration. Remove the syringe from the injection port.
8. Release the pinched tubing flush the medication into the vein.
9. Readjust the IV / IO flow rate as appropriate.
10. Document the medication, dosage, route and time of administration.
11. Monitor the patient for any adverse or allergic reactions.

### Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations,



# North Carolina College of Emergency Physicians

## Standards Procedure (Skill)

### Medication Administration: Oral



#### Clinical Indications:

- Patient in need of medication which should be given orally.

B	EMT	B
I	EMT - I	I
P	EMT - P	P

#### • Procedure:

1. Confirm the correct medication, expiration date, and dosage. Read the label to verify the drug is intended for oral administration. Check to see if the dose to be administered is dependent upon the patient's weight or other variable factors.
2. Assess the patient to be sure they are conscious and sufficiently alert to tolerate the oral administration, and that they are not allergic to the drug.
3. Recheck the order / dose for milliliters, ounces, teaspoons or tablespoons. Make sure you have calculated the dose correctly.
4. Transfer the correct dose of the medication into the appropriate container (spoon, cup, or patient's hand for tablets). If the medication is for a child, a syringe or dose measuring spoon may be appropriate. For pills or tablets, examine them to assure they are intact and unspoiled.
5. Give the medication to the patient and instruct them to drink the liquid or swallow the tablets. Have a small amount of water available for patients taking pills or tablets.
6. For oral glucose, if the patient is conscious but has AMS, you may be able to have them squeeze the medication into their mouth and swallow. If not, you may need to assist the patient. Using a tongue blade to make a pocket between the patient's cheek and gum and squeezing the glucose into this area in small amounts best does this. Care should be taken to avoid placing the glucose deep into the patient's mouth. If the patient is not able to protect their airway, this may not be appropriate. Discretion is left with the individual paramedic.
7. Document the medication, dosage, route and time of administration.
8. Monitor the patient for reactions.

#### Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate.



## North Carolina College of Emergency Physicians Standards Procedure (Skill)



### Medication Administration: Rectal

#### Clinical Indications:



- Treatment of status seizures in pediatric patients (< 5 yo) where IV access is unobtainable

#### Procedure:

1. Attach an injection cap to a #8 French (15 inches in length) feeding tube.
2. Insert the diazepam syringe into the injection cap. Make sure the needle does not puncture the lumen of the feeding tube.
3. Insure that the needle attached to the diazepam syringe is not near the rectum.
4. Do not lubricate the tube prior to insertion. The lubrication may occlude the openings on the distal end of the tube and prevent administration of the diazepam.
5. Advance the feeding tube **2 inches** into the rectum. Do not force the tube. The tube should advance with little or no resistance.
6. Administer the correct dose of diazepam.
7. Flush the injection cap and feeding tube using a syringe filled with 1 cc of normal saline to insure delivery of the diazepam. Do not use > 1 cc to flush the feeding tube as additional flush solution may cause the patient to expel the solution and the diazepam.
8. Hold the buttocks together for 1-2 minutes to prevent leakage of the medication.

#### Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate.



# North Carolina College of Emergency Physicians

## Standards Procedure (Skill)

### Medication Administration: Sublingual



#### Clinical Indications:

- Administration of nitroglycerine

B	EMT	B
I	EMT- I	I
P	EMT- P	P

#### Procedure:

1. Confirm the correct medication, expiration date, and dosage. Read the label to verify the drug is intended for sublingual administration.
2. Assess the patient to be sure they are not allergic to the drug.
3. Avoid Nitroglycerin in any patient who has taken an erectile dysfunction medication such as Viagra (sildenafil) or Levitra (vardenafil) in the past 24 hours or Cialis (tadalafil) in the past 36 hours due to potential severe hypotension.
4. Ask the patient to hold their tongue up and spray one squirt of the drug onto the tissue beneath the patient's tongue.
5. Advise the patient that they may experience some signs or symptoms because of the medication, including dizziness, headache, or a "rush." Ask the patient to report any of these symptoms to you.
6. Document the procedure, including time of administration and patient response.

#### Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate.





# North Carolina College of Emergency Physicians

## Standards Procedure (Skill)

### Medication Administration: Transdermal



#### Clinical Indications:

I	EMT- I	I
P	EMT- P	P

- Administration of nitroglycerine paste

#### Procedure:

1. Confirm the correct medication, expiration date, and dosage. Read the label to verify the drug is intended for transdermal administration. Check to see if the dose to be administered is dependent upon the patient's weight or other variable factor.
2. Assess the patient to be sure they are not allergic to the drug.
3. Avoid Nitroglycerin in any patient who has taken an erectile dysfunction medication such as Viagra (sildenafil) or Levitra (vardenafil) in the past 24 hours or Cialis (tadalafil) in the past 36 hours due to potential severe hypotension.
4. Measure out the appropriate dose by length onto the applicator paper.
5. Apply the applicator paper to the patient's skin, medication side down.
6. Advise the patient that they may experience signs and symptoms in response to the medication. Ask them to report any burning at the site, headache, dizziness, or blurred vision.
7. Monitor the patient for appropriate response to the medication.
8. Document the procedure, including time of administration and patient response.
9. Be prepared to stop medication administration by removing the applicator paper and wiping off all remaining medication.

#### Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate.





# North Carolina College of Emergency Physicians

## Standards Procedure (Skill)

### Injections: Autoinjector



	MR	
B	EMT	B
I	EMT- I	I
P	EMT- P	P

#### Clinical Indications:

Patient needing urgent medication administration when the specific medication may be given via an autoinjector.

#### Procedure:

1. Receive and confirm medication order or perform according to standing orders.
2. Prepare equipment and medication.
3. Explain the procedure to the patient and reconfirm patient allergies.
4. The most common site for autoinjector injection is the thigh.
5. Expose the selected area and cleanse the injection site with alcohol.
6. Remove the cap of the autoinjector. This releases the safety catch.
7. Firmly press the autoinjector against the anterior face of the thigh.
8. Hold the autoinjector in place for fifteen seconds to allow the full injection of the medication.
9. Withdraw the needle quickly and dispose of properly without recapping.
10. Apply pressure to the site.
11. Monitor the patient for the desired therapeutic effects as well as any possible side effects.

#### Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate.



# North Carolina College of Emergency Physicians

## Standards Procedure (Skill)

### Injections: Subcutaneous and Intramuscular



	MR	
B	EMT	B
I	EMT- I	I
P	EMT- P	P

#### Clinical Indications:

- When medication administration is necessary and the medication must be given via the SQ (not auto-injector) or IM route or as an alternative route in selected medications.

#### Procedure:

- Receive and confirm medication order or perform according to standing orders.
- Prepare equipment and medication expelling air from the syringe.
- Explain the procedure to the patient and reconfirm patient allergies.
- The most common site for subcutaneous injection is the arm.
  - Injection volume should not exceed 1 cc.
- The possible injection sites for intramuscular injections include the arm, buttock and thigh.
  - Injection volume should not exceed 1 cc for the arm
  - Injection volume should not exceed 2 cc in the thigh or buttock.
- The thigh should be used for injections in pediatric patients and injection volume should not exceed 1 cc.
- Expose the selected area and cleanse the injection site with alcohol.
- Insert the needle into the skin with a smooth, steady motion
  - SQ: 45-degree angle**  
**skin pinched**
  - IM: 90-degree angle**  
**skin flattened**
- Aspirate for blood
- Inject the medication.
- Withdraw the needle quickly and dispose of properly without recapping.
- Apply pressure to the site.
- Monitor the patient for the desired therapeutic effects as well as any possible side effects.
- Document the medication, dose, route, and time on/with the patient care report (PCR).

#### Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

# Documentation Procedures





# North Carolina College of Emergency Physicians Standards Procedure (Skill) CHARTE Documentation



B	EMT	B
I	EMT- I	I
P	EMT- P	P

## Clinical Indications:

- All patient encounters shall be documented on approved OCEM patient care reports and the documentation method used by all personnel should follow the CHARTE narrative method, as outlined below.

## Procedure:

- [C] Chief complaint: what the patient tells you, i.e. their description of the incident or problem.
  - What the patient reports. Patient quotes are useful here.
- [H] History: the immediate history and any precipitating events. Medications and allergies are included here.
  - What lead up to this event
  - Past medical history
  - Medications and allergies
- [A] Assessment: the full assessment, including initial assessment and focused history / physical exam.
  - Focus on the key findings – pertinent positive and negative findings that justify your treatment and protocol selection. Why you did or did not do something.
- [R] Treatment: any treatment given to the patient, including FR and all on scene procedures.
  - Focus on the patient's response to treatment and procedures performed.
- [T] Transport: the treatment that was given enroute to the ED and the mode of transport.
- [E] Exceptions: the problems that were encountered during the incident.
  - Unusual events or problems such as I would consider carefully what is required to be put in a chart versus an incident report.:
  - Prolonged response time
  - Prolonged scene time
  - Partial refusal of care
  - Extrication
  - Confusion about DNR status
  - Law enforcement involvement
  - Any other impediments while on the call
- Note the section of the CHARTE on the PCR with a circle, quotes or parentheses around the letter. Examples: © (H) "A" ® (T) "E"
- PCR completion instructions are included in [appendix A](#).



# North Carolina College of Emergency Physicians

## Standards Procedure (Skill)

### Refusal



B	EMT	B
I	EMT- I	I
P	EMT- P	P

#### Clinical Indications:

- Any patient who refuses EMS care after EMS has explained the necessity of transport to the Emergency Department.

#### Procedure:

- If patient refuses care, or insists on being transported to a facility other than the destination recommended by the ambulance personnel, utilize "Patient Refusal Section of the ePCR" approved by Orange County Emergency Services.
- Conduct assessment as outlined in the Refusal Policy.
- Contact Medical Control, if necessary
- Determine who may sign refusal form as outlined in the Refusal Policy
- Complete all sections of Refusal Section
- Review form with patient or authorized signer
- Provide detailed explanation of possible risks and danger signs to patient or other authorized signer
- Inform the patient to call 911, call their doctor or go to an emergency department if symptoms persist or get worse or any of the danger signs you inform them of appear.
- Read the "Patient Advice" section of the electronic referral form to patient or authorized signer.
- Complete the "Patient Advice" section on the electronic referral form by filling in the appropriate blanks and by documenting the advice or instructions you gave to the patient on the appropriate line.
- Obtain the signature of the patient or authorized signer. If the patient refuses to sign, document this fact on the Refusal section as well as the narrative of the ePCR.
- Obtain signature of a witness; preferably the witness should be someone who witnessed your explanation of risks and benefits to the patient, heard you read the "Patient Advice" to the patient, and who watched the patient sign the form.
- If no witness is available, a crew member may sign as a last resort.
- Witnesses may include law enforcement personnel.
- All witnesses should be 18 years of age (with proof of age) or older if possible.
- If no witnesses are available, leave blank. Write the witnesses' address and telephone number in the refusal section.
- Complete ePCR in addition to Refusal section. ePCR narrative must include the following documentation:
  - Competency assessments (listed above).
  - Results of history and physical exam.
  - The clinical symptoms upon which the need for transport was based.
  - Information provided to fully inform the patient and/or other authorized individual of the consequences of their refusal of treatment/transport.
  - The patient's understanding of the risk and complications of his/her choice to refuse.
  - Medical Control instructions, if any
  - Alternatives offered
  - Crew signatures
- Patients not transported via EMS will be given written discharge instructions.



# Cardiac Procedures





# 12 Lead ECG

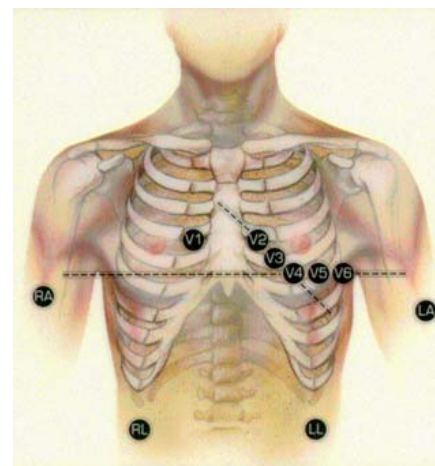
## Clinical Indications:

- Suspected cardiac patient
- Suspected tricyclic overdose
- Electrical injuries
- Syncope

B	EMT	B
I	EMT- I	I
P	EMT- P	P

## Procedure:

1. Assess patient and monitor cardiac status.
2. Administer oxygen as patient condition warrants.
3. If patient is unstable, definitive treatment is the priority. If patient is stable or stabilized after treatment, perform a 12 Lead ECG.
4. Prepare ECG monitor and connect patient cable with electrodes.
5. Enter the required patient information (patient name, etc.) into the 12 lead ECG device.
6. Expose chest and prep as necessary. Modesty of the patient should be respected.
7. Apply chest leads and extremity leads using the following landmarks:
  - RA -Right arm
  - LA -Left arm
  - RL -Right leg
  - LL -Left leg
  - V1 -4<sup>th</sup> intercostal space at right sternal border
  - V2 -4<sup>th</sup> intercostal space at left sternal border
  - V3 -Directly between V2 and V4
  - V4 -5<sup>th</sup> intercostal space at midclavicular line
  - V5 -Level with V4 at left anterior axillary line
  - V6 -Level with V5 at left midaxillary line
8. Instruct patient to remain still.
9. Press the appropriate button to acquire the 12 Lead ECG.
10. If the monitor detects signal noise (such as patient motion or a disconnected electrode), the 12 Lead acquisition will be interrupted until the noise is removed.
11. Once acquired, transmit the ECG data by fax to the appropriate hospital.
12. Contact the receiving hospital to notify them that a 12 Lead ECG has been sent.
13. Monitor the patient while continuing with the treatment protocol.
14. Download data as per guidelines and attach a copy of the 12 lead to the ACR.
15. Document the procedure, time, and results on/with the patient care report (PCR)



## Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.



# 12 Lead ECG - LifeNET®



## Clinical Indications:

- STEMI
- Post Resuscitation 12 Leads
- Any ECG constituting a call to the “bat phone”

**The transmission of the 12 lead does not replace the call to the “bat phone”.**

B	EMT	B
I	EMT- I	I
P	EMT- P	P

Paramedics are expected to accurately interpret the 12 lead and to communicate with the attending ED physician. Modems have been installed in all fourteen LIFEPAK 12's. These modems are securely housed in a side pocket of the monitor and will not be moved. The modems plug into the same connector as the data cable and should be plugged in prior to and during transmission.

1. Perform a 12 lead within **5** minutes of patient contact (patient care permitting)
2. Ensure the patient's last and first name are entered in the machine.
3. Select Transmit
4. Select Data
5. You Must select the appropriate 12-Lead report even if there is only one.  
(DO NOT Send any other report as this may render the system non functional)
6. Select **UNC** as the appropriate site
7. Unplug the data upload cable
8. Plug in the modem
9. When lights are illuminated the modem is working (The modems have cellular wireless data transmission capability and will continuously search for wireless signal)
10. Press the send button
11. Press the home button to return to the monitoring screen
12. The transmission will continue to run in the background and will be visible at bottom of the screen
13. No further action is required unless a failure message is received after transmission
14. After transmission is complete a transmission report will print
15. Once a 12 lead is transmitted, OCES administration and OCES medical directors will receive real-time notification.
16. Report any transmission failure or problem via webEOC and to the on-duty supervisor.





# Cardiac: External Pacing

## Clinical Indications:

P

EMT- P

P

- Patients with symptomatic bradycardia (less than 60 per minute) with signs and symptoms of inadequate cerebral or cardiac perfusion such as:
  - Chest Pain
  - Hypotension
  - Pulmonary Edema
  - Altered Mental Status, Confusion, etc.
  - Ventricular Ectopy
- Asystole, pacing must be done early to be effective.
- PEA, where the underlying rhythm is bradycardic and reversible causes have been treated.

## Procedure:

1. Attach standard four-lead monitor.
2. Apply defibrillation/pacing pads to chest and back:
  - One pad to left mid chest next to sternum
  - One pad to mid left posterior chest next to spine.
3. Select pacing option on monitor unit.
4. Adjust heart rate to 70 BPM for an adult and 100 BPM for a child.
5. Note pacer spikes on EKG screen.
6. Slowly increase output until capture of electrical rhythm on the monitor.
7. If unable to capture while at maximum current output, stop pacing immediately.
8. If capture observed on monitor, check for corresponding pulse and assess vital signs.
9. Consider the use of sedation or analgesia if patient is uncomfortable.
10. Document the dysrhythmia and the response to external pacing with ECG strips in the PCR.

## Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System. Assessment should include direct observation at least once per certification cycle.



# North Carolina College of Emergency Physicians Standards Procedure (Skill) Cardiopulmonary Resuscitation (CPR)



## Clinical Indications:

- Basic life support for the patient in cardiac arrest

## Procedure:

1. Assess the patient's level of responsiveness (shake and shout)
2. If no response, check for pulse (carotid for adults and older children, brachial for infants) for at least 10 seconds. If no pulse, begin chest compressions based on chart below.
3. Open the patient's airway with the head-tilt, chin-lift and look, listen, and feel for respiratory effort. If the patient may have sustained C-spine trauma, use the modified jaw thrust while maintaining immobilization of the C-spine. For infants, positioning the head in the sniffing position is the most effective method for opening the airway. \*for suspected trauma patients this step occurs prior to number 2.

	MR	
B	EMT	B
I	EMT- I	I
P	EMT- P	P

Age	Location	Depth	Rate
<b>Infant</b>	Over sternum, between nipples (inter-mammary line), 2-3 fingers	1.5 inches	At least 100/minute
<b>Child</b>	Over sternum, just cephalad from xyphoid process, heel of one hand	2 inches	At least 100/minute (3 compressions Every 2 seconds)
<b>Adult</b>	Over sternum, just cephalad from xyphoid process, hands with interlocked fingers	At least 2 inches	At least 100/minute (3 compressions Every 2 seconds)

4. Attempt to give two ventilations. If air moves successfully, go to step 5. If air movement fails, proceed to the Airway Obstruction Procedure.
5. If no advanced airway (BIAD, ETT) compressions to ventilations are 30:2 for adults, children, and infants.
6. If advanced airway is in place ventilate provide 8 - 10 breaths per minute with the BVM with uninterrupted, continuous chest compressions. Use EtCO<sub>2</sub> to guide your ventilations as directed in the Cardiac Arrest Protocol.
7. Chest compressions should be provided in an uninterrupted manner. Only brief interruptions ( < 5 seconds with a maximum of 10 seconds) are allowed for rhythm analysis, defibrillation, and performance of procedures.
8. Document the time and procedure in the Patient Care Report (PCR).

## Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by system.



# Cardioversion

## Clinical Indications:

P EMT- P P

- Unstable patient with a tachydysrhythmia (rapid atrial fibrillation, supraventricular tachycardia, ventricular tachycardia)
- Patient is not pulseless (the pulseless patient requires unsynchronized cardioversion, i.e., defibrillation)

## Procedure:

1. Ensure the patient is attached properly to a monitor/defibrillator capable of synchronized cardioversion.
2. Have all equipment prepared for unsynchronized cardioversion/defibrillation if the patient fails synchronized cardioversion and the condition worsens.
3. Consider the use of pain or sedating medications.
4. Set energy selection to the appropriate setting.
5. Set monitor/defibrillator to synchronized cardioversion mode.
6. Make certain all personnel are clear of patient.
7. Press and hold the shock button to cardiovert. Stay clear of the patient until you are certain the energy has been delivered. NOTE: It may take the monitor/defibrillator several cardiac cycles to “synchronize”, so there may be a delay between activating the cardioversion and the actual delivery of energy.
8. Note patient response and perform immediate unsynchronized cardioversion/defibrillation if the patient’s rhythm has deteriorated into pulseless ventricular tachycardia/ventricular fibrillation, following the procedure for Defibrillation-Manual.
9. If the patient’s condition is unchanged, repeat steps 2 to 8 above, using escalating energy settings.
10. Repeat until maximum setting or until efforts succeed. Consider discussion with medical control if cardioversion is unsuccessful after 2 attempts.
11. Note procedure, response, and time in the patient care report (PCR).

## Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System. Assessment should include direct observation at least once per certification cycle., or other mechanisms as deemed appropriate by the local EMS System.



# Defibrillation: Automated

## Clinical Indications:

- Patients in cardiac arrest (pulseless, non-breathing).
- Age < 8 years, use Pediatric Pads if available.

	MR	
B	EMT	B
I	EMT- I	I
P	EMT- P	P

## Contraindication:

- Pediatric patients who are so small that the pads cannot be placed without touching one another.

## Procedure:

1. If multiple rescuers available, one rescuer should provide uninterrupted chest compressions while the AED is being prepared for use.
2. Apply defibrillator pads per manufacturer recommendations. Based on 2010 guidelines, place pads preferably in AP or AL position when implanted devices (pacemakers, AICDs) occupy preferred pad positions and attempt to avoid placing directly over device.
3. Remove any medication patches on the chest and wipe off any residue.
4. If necessary, connect defibrillator leads: white to the anterior chest pad and the red to the posterior pad.
5. Activate AED for analysis of rhythm.
6. **Stop CPR and clear the patient** for rhythm analysis. Keep interruption in CPR as brief as possible.
7. Defibrillate if appropriate by depressing the “shock” button. **Assertively state “CLEAR” and visualize that no one, including yourself, is in contact with the patient prior to defibrillation.** The sequence of defibrillation charges is preprogrammed for monophasic defibrillators. Biphasic defibrillators will determine the correct joules accordingly.
8. Begin CPR (chest compressions and ventilations) immediately after the delivery of the defibrillation.
9. After 2 minutes of CPR, analyze rhythm and defibrillate if indicated. Repeat this step every 2 minutes.
10. If “no shock advised” appears, perform CPR for two minutes and then reanalyze.
11. Transport and continue treatment as indicated.
12. **Keep interruption of CPR compressions as brief as possible. Adequate CPR is a key to successful resuscitation.**
13. If pulse returns please use the Post Resuscitation Protocol

## Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System. Assessment should include direct observation at least once per certification cycle.



# Defibrillation: Manual



P EMT-P P

## Clinical Indications:

- Cardiac arrest with ventricular fibrillation or pulseless ventricular tachycardia

## Procedure:

1. **Ensure that Chest Compressions are adequate and interrupted only when absolutely necessary.**
2. Clinically confirm the diagnosis of cardiac arrest and identify the need for defibrillation.
3. After application of an appropriate conductive agent if needed, apply defibrillation hands free pads (recommended to allow more continuous CPR) or paddles to the patient's chest in the proper position
  - Paddles: right of sternum at 2nd ICS and anterior axillary line at 5th ICS
  - Pads: anterior-posterior position

For patients with implanted pacers/defibrillators, paddles or pads can be in AP or AL positions. The presence of implanted pacers/defibrillators should not delay defibrillation. Attempt to avoid placing paddles or pads directly above device.

4. Set the appropriate energy level
5. Charge the defibrillator to the selected energy level. **Continue chest compressions while the defibrillator is charging.**
6. If using paddles, assure proper contact by applying 25 pounds of pressure on each paddle.
7. **Hold Compressions, assertively state, "CLEAR" and visualize that no one, including yourself, is in contact with the patient.**
8. Deliver the countershock by depressing the discharge button(s) when using paddles, or depress the **shock button** for hands free operation.
9. Immediately resume chest compressions and ventilations for 2 minutes. After 2 minutes of CPR, analyze rhythm and check for pulse only if appropriate for rhythm.
10. Repeat the procedure every two minutes as indicated by patient response and ECG rhythm.
11. Keep interruption of CPR compressions as brief as possible. Adequate CPR is a key to successful resuscitation.

## Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System. Assessment should include direct observation at least once per certification cycle.



# Cardiac: Mechanical CPR (Lucas Device)

## Clinical Indications:

### The LUCAS Device can be considered:

- During the management of a cardiac arrest when there is an insufficient number of providers to continue high quality CPR.
- When the patient must be moved or transported and effective CPR can not be maintained or is impossible.
- If the use or set up of the device **WILL NOT** delay Manual Compressions or Defibrillations. In the event of a delay manual compressions will be continued without hesitation.
- In the event of mechanical failure Manual Compressions will be resumed immediately.

	MR	
B	EMT	B
I	EMT- I	I
P	EMT- P	P

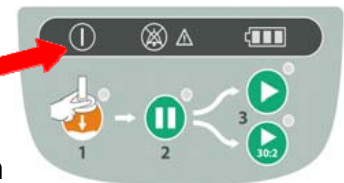
### Do not use the LUCAS Device if;

- The patient is a pediatric patient as defined by Orange County EMS System Guidelines.  
**Age less than or equal to 15 years old**
- It is not possible to position the LUCAS safely or correctly on the patient's chest.
- The patient is too small; if the LUCAS alerts with 3 fast signals when lowering the suction cup, it will not enter the "activate" mode.
- The patient is too large. If you cannot lock the upper part of the LUCAS to the back plate without compressing the patient's chest.

## Procedure:

### LUCAS does not initially take the place of good, high quality chest compressions

1. A **MINIMUM** of 3 cycles of compressions must be performed before the LUCAS Device can be considered for utilization.
2. Manual high quality Chest Compressions will be administered according to current protocols.
3. Defibrillation / Pacing Pads must be positioned so that the pads and cables are not under the suction cup.
4. Open the LUCAS case and push the On/Off button on the control panel for one (1) second and it will start the self test.
5. Remove the back plate from the case. Communicate with other team members as to when and how the back plate will be deployed on the next rhythm check.





# Standards Procedure (Skill) Cardiac Section

## Cardiac: Mechanical CPR (Lucas Device)

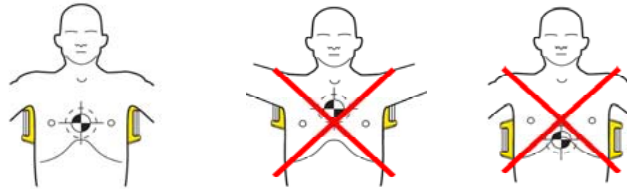
### Procedure (Continued):

6. On the next pulse check (end of 5 cycle or 2 minutes of CPR), make sure the patients head is supported and carefully place the back plate under the patient, immediately below the armpits.

Use one of these procedures:

- Raise the patient up by lifting the shoulders or pulling their arms a small distance to get the board under OR Roll the patient, insert board and roll back

- . If indicated Immediately defibrillate otherwise resume manual chest compressions immediately.



8. Using the handles on the support legs, remove the LUCAS from the case. Pull the release rings to open the claw locks. Then let go of the release rings.
9. Attach the support leg to the back plate opposite of the compressor. During the last thirty (30) seconds of the 2 minute cycle, bring the LUCAS over the chest and lock it into position while manual compressions continue.

10. At the end of the compression cycle, assure the LUCAS is in "adjust" mode (button 1), with 2 fingers, push down the suction cup until the pressure pad touches the patient's chest.

11. Press the pause button (button 2) to lock the start position.

12. If there is a BIAD (King) or other advanced airway in place press button 3 (Active) to activate continuous compressions



If no advanced airway is in place press button 3 (30:2) for the 30 compressions to 2 breaths cycle.

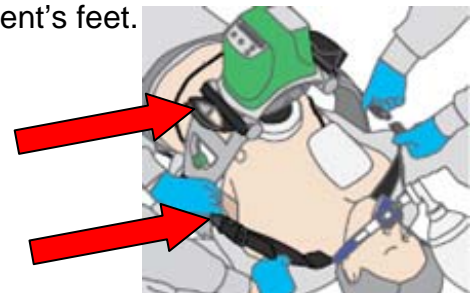
13. Pause for rhythm / pulse checks no less than every 2 minutes for no longer than 5 seconds. LUCAS compressions should continue during defibrillations.

14. Place the LUCAS Stabilization Strap behind head/neck and attach straps to the LUCAS device. This will prevent the LUCAS from migrating toward the patient's feet.

15. Place the patients arms in the Wrist Straps provided at the top of the LUCAS device arms.

Wrist Straps

LUCAS Stabilization Strap







# Parental Access Procedures





# Venous Access: Blood Draw

## Clinical Indications:

- Collection of a patient's blood for laboratory analysis

I	EMT- I	I
P	EMT- P	P

## Procedure:

- Utilize universal precautions as per OSHA.
- Select vein and prep as usual.
- Select appropriate blood-drawing devices.
- Draw appropriate tubes of blood for lab testing.
- Assure that the blood samples are labeled with the correct information (a minimum of the patients name, along with the date and time the sample was collected).
- Deliver the blood tubes to the appropriate individual at the hospital.

## Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.



# North Carolina College of Emergency Physicians Standards Procedure (Skill) Venous Access: Central Line Maintenance



## Clinical Indications:

**P****EMT- P****P**

- Transport of a patient with a central venous pressure line already in place

## Procedure:

1. Prior to transportation, ensure the line is secure.
2. Medications and IV fluids may be administered through a central venous pressure line. Such infusions must be held while the central venous pressure is transduced to obtain a central venous pressure, but may be restarted afterwards.
3. Do not manipulate the central venous catheter.
4. If the central venous catheter becomes dysfunctional, does not allow drug administration, or becomes dislodged, contact medical control.
5. Document the time of any pressure measurements, the pressure obtained, and any medication administration in the patient care report (PCR).

## Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.



# North Carolina College of Emergency Physicians Standards Procedure (Skill) Venous Access: Existing Catheters



## Clinical Indications:

P	EMT- P	P
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- Inability to obtain adequate peripheral access.
- Access of an existing venous catheter for medication or fluid administration.
- Central venous access in a patient in cardiac arrest.

## Procedure:

1. Clean the port of the catheter with alcohol wipe.
2. Using sterile technique, withdraw 5-10 ml of blood and discard syringe in sharps container.
3. Using 5cc of normal saline, access the port with sterile technique and gently attempt to flush the saline.
4. If there is no resistance, no evidence of infiltration (e.g., no subcutaneous collection of fluid), and no pain experienced by the patient, then proceed to step 4. If there is resistance, evidence of infiltration, pain experienced by the patient, or any concern that the catheter may be clotted or dislodged, do not use the catheter.
5. Begin administration of medications or IV fluids slowly and observe for any signs of infiltration. If difficulties are encountered, stop the infusion and reassess.
6. Record procedure, any complications, and fluids/medications administered in the Patient Care Report (PCR).

## Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.



# North Carolina College of Emergency Physicians Standards Procedure (Skill) Venous Access: External Jugular Access



## Clinical Indications:

I	EMT- I	I
P	EMT- P	P

- External jugular vein cannulation is indicated in a critically ill patient  $\geq 8$  years of age who requires intravenous access for fluid or medication administration and in whom an extremity vein is not obtainable.
- External jugular cannulation can be attempted initially in life threatening events where no obvious peripheral site is noted.

## Procedure:

1. Place the patient in a supine head down position. This helps distend the vein and prevents air embolism.
2. Turn the patient's head toward the opposite side if no risk of cervical injury exists.
3. Prep the site as per peripheral IV site.
4. Align the catheter with the vein and aim toward the same side shoulder.
5. Compressing the vein lightly with one finger above the clavicle, puncture the vein midway between the angle of the jaw and the clavicle and cannulate the vein in the usual method.
6. Attach the IV and secure the catheter avoiding circumferential dressing or taping.
7. Document the procedure, time, and result (success) on/with the patient care report (PCR).

## Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.



# Venous Access: Extremity

## Clinical Indications:

- Any patient where intravenous access is indicated (significant trauma, emergent or potentially emergent medical condition).

I	EMT- I	I
P	EMT- P	P

## Procedure:

- Saline locks may be used as an alternative to an IV tubing and IV fluid in every protocol at the discretion of the ALS professional.
- Paramedics can use intraosseous access where threat to life exists as provided for in the Venous Access-Intraosseous procedure.
- Use the largest catheter bore necessary based upon the patient's condition and size of veins.
- Fluid and setup choice is preferably:
  - Normal Saline with a macro drip (10 gtt/cc) for medical conditions, trauma or hypotension
  - Normal Saline with a micro drip (60 gtt/cc) for medication infusions
- Inspect the IV solution for expiration date, cloudiness, discoloration, leaks, or the presence of particles.
- Connect IV tubing to the solution in a sterile manner. Fill the drip chamber half full and then flush the tubing bleeding all air bubbles from the line.
- Place a tourniquet around the patient's extremity to restrict venous flow only.
- Select a vein and an appropriate gauge catheter for the vein and the patient's condition.
- Prep the skin with an antiseptic solution.
- Insert the needle with the bevel up into the skin in a steady, deliberate motion until the bloody flashback is visualized in the catheter.
- Advance the catheter into the vein. **Never** reinsert the needle through the catheter. Dispose of the needle into the proper container without recapping.
- Draw blood samples when appropriate.
- Remove the tourniquet and connect the IV tubing or saline lock.
- Open the IV to assure free flow of the fluid and then adjust the flow rate as per protocol or as clinically indicated.

### Rates are preferably:

- Adult: KVO: 60 cc/hr (1 gtt/ 6 sec for a macro drip set)
- Pediatric: KVO: 30 cc/hr (1 gtt/ 12 sec for a macro drip set)

### If shock is present:

- Adult: 500 cc fluid boluses repeated as long as lungs are dry and BP < 90. Consider a second IV line.
  - Pediatric: 20 cc/kg boluses repeated PRN for poor perfusion.
- Cover the site with a sterile dressing and secure the IV and tubing.
  - Label the IV with date and time, catheter gauge, and name/ID of the person starting the IV.
  - Document the procedure, time and result (success) on/with the patient care report (PCR).

## Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.





# North Carolina College of Emergency Physicians Standards Procedure (Skill) Venous Access: Intraosseous



P	EMT- P	P
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## Clinical Indications:

- Patients where rapid, regular IV access is unavailable with any of the following:
- Cardiac arrest.
- Multisystem trauma with severe hypovolemia.
- Severe dehydration with vascular collapse and/or loss of consciousness.
- Respiratory failure / Respiratory arrest.
- Burns.

## Contraindications:

- Fracture proximal to proposed intraosseous site.
- History of Osteogenesis Imperfecta
- Current or prior infection at proposed intraosseous site.
- Previous intraosseous insertion or joint replacement at the selected site.

## Procedure:

1. Don personal protective equipment (gloves, eye protection, etc.).
2. Identify anteromedial aspect of the proximal tibia (bony prominence below the knee cap). The insertion location will be 1-2 cm (2 finger widths) below this. If this site is not suitable, and patient >12 years of age, identify the anteriomedial aspect of the distal tibia (2 cm proximal to the medial malleolus). Proximal humerus is also an acceptable insertion site: for patients > 40 Kg, lateral aspect of the humerus, 2 cm distal to the greater tuberosity.
3. Prep the site recommended by the device manufacturer with providone-iodine ointment or solution.
4. For manual pediatric devices, hold the intraosseous needle at a 60 to 90 degree angle, aimed away from the nearby joint and epiphyseal plate, twist the needle handle with a rotating grinding motion applying controlled downward force until a "pop" or "give" is felt indicating loss of resistance. Do not advance the needle any further.
5. For the EZ-IO intraosseous device, hold the intraosseous needle at a 60 to 90 degree angle, aimed away from the nearby joint and epiphyseal plate, power the driver until a "pop" or "give" is felt indicating loss of resistance. Do not advance the needle any further. Utilize the yellow needle for the proximal humerus. The pink needle is only intended for use in neonatal patients.
6. For the Bone Injection Gun (BIG), find and mark the manufacturers recommended site. Position the device and pull out the safety latch. Trigger the BIG at 90° to the surface and remove the injection device.
7. Remove the stylette and place in an approved sharps container.
8. Attach a syringe filled with at least 5 cc NS; aspirate bone marrow for manual devices only, to verify placement; then inject at least 5 cc of NS to clear the lumen of the needle.
9. Attach the IV line and adjust flow rate. A pressure bag may assist with achieving desired flows.
10. Stabilize and secure the needle with dressings and tape.
11. You may administer 10 to 20 mg (1 to 2 cc) of 2% Lidocaine in adult patients who experience infusion-related pain. This may be repeated prn to a maximum of 60 mg (6 cc).
12. Following the administration of any IO medications, flush the IO line with 10 cc of IV fluid.
13. Document the procedure, time, and result (success) on/with the patient care report (PCR).

## Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System. Assessment should include direct observation at least once per certification cycle.





## Arterial Access: Line Maintenance

### Clinical Indications:

P

EMT- P

P

- Transport of a patient with an existing arterial line.

### Procedure:

1. Make certain arterial line is secured prior to transport, including intersection of arterial catheter and IV/Monitoring lines.
2. Use available equipment for monitoring of arterial pressures via arterial line.
3. Do not use the arterial line for administration of any fluids or medications.
4. If there is any question regarding dislodgement of the arterial line and bleeding results, remove the line and apply direct pressure over the site for at least five minutes before checking to ensure hemostasis.

### Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.



# North Carolina College of Emergency Physicians Standards Procedure (Skill) CNS Catheter: Epidural Catheter Maintenance



## Clinical Indications:

P EMT-P P

- Presence of an epidural catheter in a patient requiring transport

## Procedure:

1. Prior to transport, ensure catheter is secure and that transport personnel are familiar with medication(s) being delivered and devices used to control medication administration.
2. No adjustments in catheter position are to be attempted.
3. No adjustments in medication dosage or administration are to be attempted without direct approval from on-line medical control.
4. Report any complications immediately to on-line medical control.
5. Document the time and dose of any medication administration or rate adjustment in the patient care report (PCR).

## Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.



# Wound Care / Trauma Procedures





# Wound Care-General

## Clinical Indications:

- Protection and care for open wounds prior to and during transport.

	MR	
B	EMT	B
I	EMT- I	I
P	EMT- P	P

## Procedure:

1. Use personal protective equipment, including gloves, gown, and mask as indicated.
2. If active bleeding, elevate the affected area if possible and hold direct pressure. Do not rely on "compression" bandage to control bleeding. Direct pressure is much more effective.
3. Once bleeding is controlled, irrigate contaminated wounds with saline as appropriate (this may have to be avoided if bleeding was difficult to control). Consider analgesia per protocol prior to irrigation.
4. Cover wounds with sterile gauze/dressings. Check distal pulses, sensation, and motor function to ensure the bandage is not too tight.
5. Monitor wounds and/or dressings throughout transport for bleeding.
6. Document the wound and assessment and care in the patient care report (PCR).

## Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.



# Wound Care-Hemostatic Agent



## Clinical Indications:

- Serious hemorrhage that can not be controlled by other means.

## Contraindications:

- Wounds involving open thoracic or abdominal cavities.

## Procedure:

1. Apply approved non-heat-generating hemostatic agent per manufacturer's instructions.
2. Supplement with direct pressure and standard hemorrhage control techniques.
3. Apply dressing.

## Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

	MR	
B	EMT	B
I	EMT- I	I
P	EMT- P	P



# Wound Care-Taser® Probe Removal



	MR	
B	EMT	B
I	EMT- I	I
P	EMT- P	P

## Clinical Indications:

- Patient with uncomplicated conducted electrical weapon (Taser®) probes embedded subcutaneously in non-sensitive areas of skin.
- Taser probes are barbed metal projectiles that may embed themselves up to 13 mm into the skin.

## Contraindications:

- Patients with conducted electrical weapon (Taser®) probe penetration in vulnerable areas of body as mentioned below should be transported for further evaluation and probe removal
- Probes embedded in skin above level of clavicles, female breasts, or genitalia
- Suspicion that probe might be embedded in bone, blood vessel, or other sensitive structure.

## Procedure:

- Ensure wires are disconnected from weapon.
- Stabilize skin around probe using non-dominant hand.
- Grasp probe by metal body with pliers or hemostats to prevent puncture wounds to EMS personnel.
- Remove probe in single quick motion.
- Wipe wound with antiseptic wipe and apply dressing.

## Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.



# Wound Care-Tourniquet

	MR	
B	EMT	B
I	EMT- I	I
P	EMT- P	P

## Clinical Indications:

- Life threatening extremity hemorrhage that can not be controlled by other means.
- Serious or life threatening extremity hemorrhage and tactical considerations prevent the use of standard hemorrhage control techniques.

## Contraindications:

- Non-extremity hemorrhage
- Proximal extremity location where tourniquet application is not practical

## Procedure:

1. Place tourniquet proximal to wound
2. Tighten per manufacturer instructions until hemorrhage stops and/or distal pulses in affected extremity disappear.
3. Secure tourniquet per manufacturer instructions
4. Note time of tourniquet application and communicate this to receiving care providers
5. Dress wounds per standard wound care protocol
6. If delayed or prolonged transport and tourniquet application time > 45 minutes: consider reattempting standard hemorrhage control techniques and removing tourniquet

## Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.





# Chest Decompression

## Clinical Indications:

P EMT-P P

- Patients with hypotension (SBP <90), clinical signs of shock, and at least one of the following signs:
  - Jugular vein distention.
  - Tracheal deviation away from the side of the injury (often a late sign).
  - Absent or decreased breath sounds on the affected side.
  - Hyper-resonance to percussion on the affected side.
  - Increased resistance when ventilating a patient.
- Patients in traumatic arrest with chest or abdominal trauma for whom resuscitation is indicated. These patients may require bilateral chest decompression even in the absence of the signs above.

## Procedure:

1. Don personal protective equipment (gloves, eye protection, etc.).
2. Administer high flow oxygen.
3. Identify and prep the site:
  - Locate the second intercostals space in the mid-clavicular line on the same side as the pneumothorax.
  - If unable to place anteriorly, lateral placement may be used at the fourth ICS mid-axillary line.
  - Prepare the site with providone-iodine ointment or solution.
4. Insert the catheter (14 gauge for adults) into the skin over the third rib and direct it just over the top of the rib (superior border) into the interspace.
5. Advance the catheter through the parietal pleura until a “pop” is felt and air or blood exits under pressure through the catheter, then advance catheter only to chest wall.
6. Remove the needle, leaving the plastic catheter in place.
7. Secure the catheter hub to the chest wall with dressings and tape.
8. Consider placing a finger cut from an exam glove over the catheter hub. Cut a small hole in the end of the finger to make a flutter valve. Secure the glove finger with tape or a rubber band. (Note – don’t waste much time preparing the flutter valve; if necessary control the air flow through the catheter hub with your gloved thumb.)

## Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System. Assessment should include direct observation once per certification cycle.



# Splinting

## Clinical Indications:

	MR	
B	EMT	B
I	EMT- I	I
P	EMT- P	P

- Immobilization of an extremity for transport, either due to suspected fracture, sprain, or injury.
- Immobilization of an extremity for transport to secure medically necessary devices such as intravenous catheters

## Procedure:

1. Assess and document pulses, sensation, and motor function prior to placement of the splint. If no pulses are present consider reduction of the fracture after discussion and authorization by Medical Control.
2. Remove all clothing from the extremity.
3. Select a site to secure the splint both proximal and distal to the area of suspected injury, or the area where the medical device will be placed.
4. Do not secure the splint directly over the injury or device.
5. Place the splint and secure with Velcro, straps, or bandage material (e.g., kling, kerlex, cloth bandage, etc.) depending on the splint manufacturer and design.
6. Document pulses, sensation, and motor function after placement of the splint. If there has been a deterioration in any of these 3 parameters, remove the splint and reassess
7. If a femur fracture is suspected and there is no evidence of pelvic fracture or instability, the following procedure may be followed for placement of a femoral traction splint:
  - Assess neurovascular function as in #1 above.
  - Place the ankle device over the ankle.
  - Place the proximal end of the traction splint on the posterior side of the affected extremity, being careful to avoid placing too much pressure on genitalia or open wounds. Make certain the splint extends proximal to the suspected fracture. If the splint will not extend in such a manner, reassess possible involvement of the pelvis
  - Extend the distal end of the splint at least 6 inches beyond the foot.
  - Attach the ankle device to the traction crank.
  - Twist until moderate resistance is met.
  - Reassess alignment, pulses, sensation, and motor function. If there has been deterioration in any of these 3 parameters, release traction and reassess.
8. Document the time, type of splint, and the pre and post assessment of pulse, sensation, and motor function in the patient care report (PCR).

## Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.



# Spinal Immobilization

## Clinical Indications:

- Need for spinal immobilization as determined by protocol

	MR	
B	EMT	B
I	EMT- I	I
P	EMT- P	P

## Procedure:

1. Gather a backboard, straps, C-collar appropriate for patient's size, tape, and head rolls or similar device to secure the head.
2. Explain the procedure to the patient
3. Place the patient in an appropriately sized C-collar while maintaining in-line stabilization of the C-spine. This stabilization, to be provided by a second rescuer, should not involve traction or tension but rather simply maintaining the head in a neutral, midline position while the first rescuer applied the collar.
4. Once the collar is secure, the second rescuer should still maintain their position to ensure stabilization (the collar is helpful but will not do the job by itself.)
5. Place the patient on a long spine board with the log-roll technique if the patient is supine or prone. For the patient in a vehicle or otherwise unable to be placed prone or supine, place them on a backboard by the safest method available that allows maintenance of in-line spinal stability.
6. Stabilize the patient with straps and head rolls/tape or other similar device. Once the head is secured to the backboard, the second rescuer may release manual in-line stabilization.
7. NOTE: Some patients, due to size or age, will not be able to be immobilized through in-line stabilization with standard backboards and C-collars. Never force a patient into a non-neutral position to immobilize them. Such situations may require a second rescuer to maintain manual stabilization throughout the transport to the hospital. Special equipment such as football players in full pads and helmet may remain immobilized with helmet and pads in place.
8. Document the time of the procedure in the patient care report (PCR).

## Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

# Policies



Standards Policy: Medical Policy Section

# Criteria for Death / Withholding Resuscitation



## Policy:

CPR and ALS treatment are to be withheld only if the patient is obviously dead or a valid North Carolina ***MOST and/or Do Not Resuscitate*** form (see separate policy) is present.

## Purpose:

The purpose of this policy is to:

- Honor those who have obviously expired prior to EMS arrival.

## Procedure:

1. If a patient is in complete cardiopulmonary arrest (clinically dead) and meets one or more of the criteria below, CPR and ALS therapy need not be initiated:
  - Body decomposition
  - Rigor mortis
  - Dependent lividity
  - Blunt force trauma
  - Injury not compatible with life (i.e., decapitation, burned beyond recognition, massive open or penetrating trauma to the head or chest with obvious organ destruction)
  - Extended downtime with Asystole on the ECG
2. If a bystander or first responder has initiated CPR or automated defibrillation prior to an EMS paramedic's arrival and any of the above criteria (signs of obvious death) are present, the paramedic may discontinue CPR and ALS therapy. All other EMS personnel levels must communicate with medical control prior to discontinuation of the resuscitative efforts.
3. If doubt exists, start resuscitation immediately. Once resuscitation is initiated, continue resuscitation efforts until either:
  - a) Resuscitation efforts meet the criteria for implementing the **Discontinuation of Prehospital Resuscitation Policy** (see separate policy)
  - b) Patient care responsibilities are transferred to the destination hospital staff.



## Deceased Subjects

### Policy:

EMS will handle the disposition of deceased subjects in a uniform, timely, and consistent manner.

### Purpose:

The purpose of this policy is to:

- Organize a timely disposition of any deceased subject
- Maintain respect for the deceased and family
- Allow EMS to return to service in a timely manner.

### Procedure:

1. Do not remove lines or tubes placed by EMS from the patient unless directed below.
2. Notify the law enforcement agency within jurisdiction.
3. If subject was found deceased by EMS or if resuscitation in the field is unsuccessful, the scene and the decedent are turned over to law enforcement.
4. EMS will not initiate contact with the medical examiner or family physician, but will talk with either at the request of law enforcement on the scene to provide medical details about resuscitative efforts or physical findings.
5. Transport arrangements should be made by law enforcement in concert with family wishes. Normally, transport will be by contracted Medical Examiners Office contract transporter.
6. If the deceased subject's destination is other than the county morgue, any line(s) or tube(s) placed by EMS should be removed prior to transport.
7. Document the situation, investigating law enforcement agency, law enforcement officer's name, and anticipated destination of the decedent on the patient care report form (PCR).
8. If requested by Law Enforcement, include a toe tag with the deceased subject for morgue transport.
9. Responsibility for determining the identification of a deceased subject falls to the law enforcement agency. EMS will not initiate a search for identification or attempt to identify a decedent except to assist a law enforcement officer at the officer's request.
10. On the direction of Law Enforcement, EMS will move the deceased subject to a nearby appropriate location to await transport to the Medical Examiner's Office.
11. If the decedent is in the ambulance, the remains will be transferred directly to the transport agency's vehicle unless specifically directed otherwise by law enforcement.
12. In unusual circumstance, and with Watch Officer approval, EMS may transport the decedent to the County's facility.

## Standards Policy: Medical Policy Section

# Difficult Airway Evaluation



**Purpose:** Between 1 – 3% of patients who require endotracheal intubation have airways that make intubation difficult. Recognizing those patients who may have a difficult airway allows the paramedic to proceed with caution and to keep as many options open as possible. It also allows the paramedic to prepare additional equipment (such as a cricothyrotomy kit) that may not ordinarily be part of a standard airway kit.

### Procedure:

1. The mnemonic LEMON is useful in evaluating patients for signs that may be consistent with a difficult airway and should raise the paramedic's index of suspicion.
  - Look externally  
External indicators of either difficult intubation or difficult ventilation include: presence of a beard or moustache, abnormal facial shape, extreme cachexia, edentulous mouth, facial trauma, obesity, large front teeth or "buck teeth", high arching palate, receding mandible, short bull neck.
  - Evaluate 3-3-2 Rule  
3 fingers between the patient's teeth (patient's mouth should open adequately to permit three fingers to be placed between the upper and lower teeth) 3 fingers between the tip of the jaw and the beginning of the neck (under the chin) 2 fingers between the thyroid notch and the floor of the mandible (top of the neck)
  - Mallampati  
This scoring system is based on the work of Mallampati et al published in the Canadian Anaesthesia Society Journal in 1985. The system takes into account the anatomy of the mouth and the view of various anatomical structures when the patient opens his mouth as wide as possible. This test is performed with the patient in the sitting position, the head held in a neutral position, the mouth wide open, and the tongue protruding to the maximum. Inappropriate scoring may occur if the patient is in the supine position (instead of sitting), if the patient phonates or if the patient arches his or her tongue.

Class I (easy) = visualization of the soft palate, fauces, uvula, anterior and posterior pillars.

Class II = visualization of the soft palate, fauces and uvula.

Class III = visualization of the soft palate and the base of the uvula.

Class IV (difficult) = soft palate is not visible at all.



Class I



Class II



Class III



Class IV

## Standards Policy: Medical Policy Section

# Difficult Airway Evaluation



- **Obstruction?**

Besides the obvious difficulty if the airway is obstructed with a foreign body, the paramedic should also consider other obstructers such as tumor, abscess, epiglottitis, or expanding hematoma.

- **Neck Mobility**

Ask the patient to place their chin on their chest and to tilt their head backward as far as possible. Obviously, this will not be possible in the immobilized trauma patient.



Standards Policy: Medical Policy Section

# Discontinuation of Prehospital Resuscitation



## Policy:

Unsuccessful cardiopulmonary resuscitation (CPR) and other advanced life support (ALS) interventions may be discontinued prior to transport or arrival at the hospital when this procedure is followed.

## Purpose:

The purpose of this policy is to:

- Allow for discontinuation of prehospital resuscitation after the delivery of adequate and appropriate ALS therapy.

## Procedure:

1. Discontinuation of CPR and ALS intervention may be implemented **prior to contact with Medical Control** if **ALL** of the following criteria have been met:
  - Patient must be 18 years of age or older
  - Adequate CPR has been administered
  - Airway has been successfully managed with verification of device placement. Acceptable management techniques include orotracheal intubation, nasotracheal intubation, Blind Insertion Airway Device (BIAD) placement, or cricothyrotomy
  - IV or IO access has been achieved
  - No evidence or suspicion of any of the following:
    - Drug/toxin overdose
    - Active internal bleeding
    - Hypothermia
    - Preceding trauma
  - Rhythm appropriate medications and defibrillation have been administered according to local EMS Protocols for a total of 3 cycles of drug therapy without return of spontaneous circulation (palpable pulse)
  - All EMS paramedic personnel involved in the patient's care agree that discontinuation of the resuscitation is appropriate
2. If all of the above criteria are not met and discontinuation of prehospital resuscitation is desired, **contact Medical Control**.
3. The **Deceased Subjects Policy** should be followed.

Document all patient care and interactions with the patient's family, personal physician, medical examiner, law enforcement, and medical control in the EMS patient care report (PCR).

# Patient Medication Self-Administration



## Policy:

A patient who wishes to take his or her own medication or prescription should do so only in conjunction with the care provided by EMS personnel. If the patient medication is not an approved EMS medication and the patient is being transported by EMS, then the specific situation should be approved by Medical Control.

## Purpose:

To protect patients health and wellbeing and the safety of the EMS System.

## Procedure:

1. If a patient wishes to take a personal medication that is related to the reason for which EMS was called, and that medication is indicated for the situation, then the paramedic may approve of the patient taking the medication. For example, a diabetic patient who has high blood sugar and has not taken their own insulin may take it as prescribed in consultation with the paramedic.
2. If a patient wishes to take a personal medication that is not known to the EMS personnel, then **Medical Control** should be contacted to discuss the situation and medication.
3. EMS should restrict medication advice offered to patients to basic over-the-counter medications for common maladies, such as ibuprofen or acetaminophen.

Standards Policy: Medical Policy Section

# Patient Without a Protocol



## Policy:

Anyone requesting EMS services will receive a professional evaluation, treatment, and transportation (if needed) in a systematic, orderly fashion regardless of the patient's problem or condition.

## Purpose:

- To ensure the provision of appropriate medical care for every patient regardless of the patient's problem or condition.

## Procedure:

1. Treatment and medical direction for all patient encounters, which can be triaged into an EMS patient care protocol, is to be initiated by protocol.
2. When confronted with an emergency or situation that does not fit into an existing EMS patient care protocol, the patient should be treated by the **Universal Patient Care Protocol** and a **Medical Control Physician** should be contacted for further instructions.

**Policy:**

The state poison center should be utilized by the 911 centers and the responding EMS services to obtain assistance with the prehospital triage and treatment of patients who have a potential or actual poisoning.

**Purpose:**

The purpose of this policy is to:

- Improve the care of patients with poisonings, envenomations, and environmental/biochemical terrorism exposures in the prehospital setting.
- Provide for the most timely and appropriate level of care to the patient, including the decision to transport or treat on the scene.
- Integrate the State Poison Center into the prehospital response for hazardous materials and biochemical terrorism responses

**Procedure:**

1. The 911 call center will identify and if EMD capable, complete key questions for the Overdose/Poisoning, Animal Bites/Attacks, or Carbon Monoxide/Inhalation/HazMat emergency medical dispatch complaints and dispatch the appropriate EMS services and/or directly contact the State Poison Center for consultation.
2. If no immediate life threat or need for transport is identified, EMS personnel may conference the patient/caller with the Poison Center Specialist at the **State Poison Center at 800-222-1222**. If possible, dispatch personnel should remain on the line during conference evaluation.
3. The Poison Center Specialist at the State Poison Center will evaluate the exposure and make recommendations regarding the need for on-site treatment and/or hospital transport in a timely manner. If dispatch personnel are not on-line, the Specialist will recontact the 911 center and communicate these recommendations.
4. If the patient is determined to need EMS transport, the poison center Specialist will contact the receiving hospital and provide information regarding the poisoning, including treatment recommendations. EMS may contact medical control for further instructions or to discuss transport options.
5. If the patient is determined not to require EMS transport, personnel will give the phone number of the patient/caller to the Poison Center Specialist. The Specialist will initiate a minimum of one follow-up call to the patient/caller to determine the status of patient.
6. Minimal information that should be obtained from the patient for the state poison center includes:
  - Name and age of patient
  - Time of exposure
  - Signs and symptoms
  - Substance(s) involved
  - Any treatment given
7. Minimal information which should be provided to the state poison center for mass poisonings, including biochemical terrorism and HazMat, includes:
  - Substance(s) involved
  - Signs and symptoms
  - Time of exposure
  - Any treatment given





# Transports to UNC ED Hillsborough

**Purpose:**

To identify which patients are appropriate to transport to UNC Hillsborough Campus

**Policy:**

1. Paramedics will adhere to the Triage Destination Plans contained in the protocol manual.
2. Based upon the limited capabilities of the UNC Hillsborough Campus, no patients in any of the following categories will be transported to the UNC Hillsborough Campus:
  - Patients meeting the Pediatric, STEMI, Stroke, Trauma and Burn, Sepsis, or Cardiac Arrest Destination Plan
  - CVA/TIA symptoms not meeting alert criteria
  - Pregnancy related complaint or active labor > 20 weeks
  - Open fractures
  - Unstable pediatric patients
  - Renal/Dialysis
  - Psychiatric
  - Seizure
3. In rare instances of a failed airway, impending arrest, difficult childbirth or other circumstances when the EMS crew needs urgent assistance AND they are in the close proximity of the Hillsborough Campus, crews should consider diverting for stabilization. In these instances the EMS crew should remain in the ED and be prepared to continue transport to the UNC Medical Center Campus as the patient is stabilized. The Quality Assurance Coordinator will review the case closely following the diversion.
4. Providers shall use the Hillsborough Campus radio talk group only when transporting to the Hillsborough Campus ED.
5. Providers may obtain medical control orders from either campus but should always call medical control at the UNC Facility where they intend to transport the patient.
6. The paramedic is ultimately responsible for the best care of the patient including the appropriate destination decision.

# Standards Policy: Medical Policy Section

## Women's Birth and Wellness Center



### Policy:

The Women's Birth and Wellness Center of Chapel Hill has certified nurse midwives on staff. Orange County is routinely called to the Women's Birth Center.

### The Role of the Midwife

- A) Carrying out examinations necessary to establish and monitor normal pregnancies.
- B) Advising mothers-to-be on securing the examinations necessary for the earliest possible diagnosis of pregnancies at risk.
- C) Providing education and preparation of clients for childbirth, including advice on exercise and nutrition.
- D) Caring for and assisting the mother during labor and monitoring the condition of the fetus by the appropriate clinical and technical means.
- E) Supervising and assisting with spontaneous vaginal deliveries.
- F) Recognizing the warning signs of abnormality in the mother or infant that necessitates referral to a physician.
- G) Taking necessary emergency measures in the event of a crisis.
- H) Examining and caring for the newborn infant.
- I) Caring for the mother in the postpartum period and advising her on infant care and family planning.

### Purpose:

- To identify a chain of command to allow field personnel to adequately care for the patient
- To assure the patient receives the maximum benefit from pre-hospital care
- To provide a mechanism for which the certified nurse mid wife may continuing treatment of the patient(s)
- To minimize the liability of the EMS system as well as the Women's Birth and Wellness Center.

### Procedure:

1. Upon being dispatched on a request for ambulance service to an out-of-hospital birth scene, paramedics will obtain from dispatch all pertinent information related to the call and specific instructions.
2. Upon arrival at the scene of an out-of-hospital birth where a person is assisting the mother, the paramedic will determine the following;
  - a) Confirm the nature of the request for ambulance service and who requested the service.
  - b) The condition of the patient(s) and the progression of the labor and/or delivery.
  - c) The capacity in which the person assisting with the birth is acting (i.e. trained midwife, nurse, person of non-medical background).
3. When a person assisting with the out-of-hospital birth identifies themselves as a midwife, the paramedic will confirm with the patient that this person has been retained by them to assist with the birth.
4. The paramedic will work cooperatively with the midwife in providing quality care to the patient and/or neonate at the scene and throughout transportation to the hospital. If conflict occurs, the paramedic and midwife should attempt to work together for the mutual benefit of the patient. If agreement is unable to be reached, the paramedic should consult with Medical Control.
5. With the patient's consent for care and transport, the paramedic is ultimately responsible for the welfare of the patient, regardless of whether or not the paramedic utilizes the midwife's expertise and assistance.

Standards Policy: Medical Policy Section

# Women's Birth and Wellness Center



6. Medical direction of pre-hospital care is the responsibility of those most appropriately trained in providing such care. Only UNC Emergency Department Physicians are eligible to provide on line medical direction when applicable. All care should be provided within the rules and regulations of the state of North Carolina and Orange County EMS Protocols.
  7. If birth has occurred, EMS will notify UNC ED with a "code stork" alert. The neonate will be evaluated in the emergency department and EMS should not transfer directly to NICU.
  8. EMS shall bring all appropriate neonatal resuscitation equipment when transporting the neonate or the patient in active labor to labor and delivery or NICU.
  9. Upon completion of a call to an out-of-hospital birth scene with a midwife present, the paramedic will note in the electronic patient care report, the midwife's presence and involvement, (including the name of the midwife).
  10. Oxytocin\* (Pitocin) is a medication that is commonly utilized for post-partum hemorrhage or induction; this medication can be continued in an infusion as long as the Nurse Midwife is able to accompany the patient to the hospital.
  11. Any other medications or procedures that the Midwife feels are appropriate can be administered by the Midwife under their own license during transport.
- \* Oxytocin (Pitocin) is a hormone that is important for controlling bleeding in post-partum patients by contracting the uterus and should be continued when possible for patients with significant post-partum hemorrhage.



**Purpose:**

This policy is intended to provide assistance to Emergency Medical Service personnel and provide secondary consultation during critical events for better patient outcome.

**Policy:**

1. All airway complications or use of surgical cricothyrotomy require discussion with the Medical Director as soon as medically feasible.
2. If a medication error occurs the personnel responsible is to contact the Medical Director after transferring patient care where they notify the attending physician and on-duty Supervisor.



# Opiate Overdose

**Policy:**

Patients who have experienced an isolated IV opiate overdose should be offered a variety of options to more appropriately manage their addiction.

**Purpose:**

The purpose of this policy is to:

- Ensure that the patient is offered various options for treatment of substance abuse.
- Provide harm reduction measures.

**Procedure:**

1. All patients must be over 18 years of age and must not have been in cardiac arrest during the incident.
2. The patient must regain a normal mental status and respiratory effort after the administration of Naloxone.
3. Transport to the Emergency Department should be offered to all patients.
4. For patients who decline transport to the Emergency Department, alternative destinations should be offered when possible. These options could include assistance with inpatient treatment centers such as Freedom House, outpatient facilities, mobile crisis solutions, addiction specialists, other local treatment options.
5. In order to decline transport, the patient must meet the following criteria:
  - a) Be 18 years or older
  - b) Maintain a GCS of 15
  - c) Fully alert and oriented
  - d) Be able to understand the risk of refusing transport, as described in Universal Protocol 1 (UP 1)
6. If the patient declines transport to the Emergency Department, an additional dose of 2mg Naloxone should be administered **IM** by EMS. A Naloxone kit should be left with the patient, family, and/or friends on the scene. EMS will provide education on how to use these kits.
7. In addition to the medication, the following items should be utilized when possible:
  - a) Offer to dispose of any dirty needles
  - b) Provide clean needles/syringes when possible
  - c) Refer to a community peer support team if available
  - d) Leave literature on resources for substance abuse treatment
  - e) Notification of policy utilization should be made to the EMS Operations Manager via email after any naloxone kits are distributed.



# **Operational Policies**

## Standards Policy: Operational Policy Section

# Air Transport



### Policy:

Air transport should be utilized whenever patient care can be improved by decreasing transport time or by giving advanced care not available from ground EMS services, but available from air medical transport services (i.e. blood).

### Purpose:

The purpose of this policy is to:

- Improve patient care in the prehospital setting.
- Allow for expedient transport in serious, mass casualty settings.
- Provide life-saving treatment such as blood transfusion.
- Provide more timely access to interventional care in acute Stroke and ST-elevation myocardial infarction (STEMI) patients

### Procedure:

Patient transportation via ground ambulance will not be delayed to wait for helicopter transportation. If the patient is packaged and ready for transport and the helicopter is not on the ground, or within a reasonable distance, the transportation will be initiated by ground ambulance.

Air transport should be considered if any of the following criteria apply:

- High priority patient with > 20 minute transport time
- Entrapped patients with > 10 minute estimated extrication time
- Multiple casualty incident with red/yellow tag patients
- Multi-trauma or medical patient requiring life-saving treatment not available in prehospital environment (i.e., blood transfusion, invasive procedure, operative intervention)
- Time dependent medical conditions such as acute ST-elevation myocardial infarctions (STEMI) or acute Stroke that could benefit from the resources at a specialty center as per the EMS System's Stroke and STEMI Plans.

If a potential need for air transport is anticipated, but not yet confirmed, an air medical transport service can be placed on standby.

If the scene conditions or patient situation improves after activation of the air medical transport service and air transport is determined not to be necessary, paramedic or administrative personnel may cancel the request for air transport.

Minimal Information which should be provided to the air medical transport service include:

- Number of patients
- Age of patients
- Sex of patients
- Mechanism of injury or complaint (MVC, fall, etc)



## Blood Draw on Law Enforcement Request

The Orange County Emergency Services – EMS Division fully supports the Law Enforcement community efforts to remove impaired drivers from the roads. In that effort, all paramedics credentialed by the Medical Director to perform as independent practice paramedics are authorized to draw blood under subject's consent or by court order for reasons of suspicion as stipulated by the appropriate law enforcement agency involved. At any point in the process, EMS personnel may have to either begin transportation or respond to additional emergencies based on the paramedics discretion, no matter where in the process of the evidence collection they may be.

### Purpose:

The purpose is to provide a standard policy for performing forensic blood draw at the request of law enforcement in accordance with NCGS § 20.16.2, *Implied consent to chemical analysis; mandatory revocation of license in event of refusal; right of driver to request analysis* and NCGS § 20-139.1, *Procedures governing chemical analyses; admissibility; evidentiary provisions; controlled-drinking programs*.

### Procedure:

Only credential paramedics (not student, cadet, EMT- Intermediate or phase eligible paramedics) are authorized to draw blood for evidence collection under this policy for Forensic Blood Draw:

- 1) Paramedics should perform blood draws when requested by law Enforcement Officers (LEO) due to the suspicion of a subject Driving Under the Influence (DUI).
- 2) The paramedic shall determine if the subject is a patient by direct observation, professional instinct, or if a non-solicited general medical or traumatic complaint is offered by the subject.
- 3) Transportation of a critical or "trauma" patient shall not be delayed for a blood draw.
- 4) EMS shall not draw blood from a deceased subject.
- 5) The subject must be in custody and the LEO must present an appropriate Biological Blood Specimen Kit.
- 6) The Subject must consent OR be under subpoena at the time of procedure. Uncooperative subjects and inappropriate manpower will never be combined with sharp needles and blood borne pathogens for the safety of the patient, EMS personnel and the LEOs.

### 7) Documentation:

If called by LEO only for a forensic blood draw, the patient category must be listed as "Law Enforcement Blood Draw" and the outcome as "Law Enforcement Response." The Subject's Name, Date of Birth, and Social Security Number, if available, shall be documented and be placed in the Patient demographic tab. Please note that no other "patient" information is required if this solely a forensic blood draw. The blood draw should be entered in the treatment tab as a blood draw, documenting the serial number of the evidence container and time of needle insertion. A narrative documenting the evidence collection is required but does not have to be in D-CHARTe format unless the subject is determined to be a patient.

If the subject is declared a patient at any point in the process, a complete assessment is required and the ePCR shall be completed including the use of the D-CHARTe method of documentation. A person in custody may decline care and assessment, but the refusal process must be followed according to the Orange County Emergency Services – EMS Division Advanced Life Support Protocols and Policies.

If the subject is uncooperative and you fear that either you, your crew, the LEO, or the subject may be injured as a result of their behavior, you may refuse. However, you must inform the LEO of the refusal and reason for the refusal. A written statement may be required. If so, provide a statement and maintain a copy to be submitted with the ePCR.



## Standards Policy: Operational Policy Section

# Back In Service Time



### Policy:

All EMS Units transporting a patient to a medical facility shall transfer the care of the patient and complete all required operational tasks to be back in service for the next potential EMS event within 30 minutes of arrival to the medical facility, 90% of the time.

### Definition:

The EMS Back in Service Time is defined as the time interval beginning with the time the transporting EMS Unit arrives at the medical facility destination and ending with the time the EMS Unit checks back in service and available for the next EMS event.

### Purpose:

The purpose of this policy is to:

- Assure that the care of each EMS patient transported to a medical facility is transferred to the medical facility staff in a timely manner.
- Assure that the EMS unit is cleaned, disinfected, restocked, and available for the next EMS event in a timely manner.
- Assure that an interim or complete EMS patient care report (PCR) is completed and left with the receiving medical facility documenting, at a minimum, the evaluation and care provided by EMS for that patient (It is acceptable to leave the PreMIS Preliminary Report or equivalent if the final PCR cannot be completed before leaving the facility).
- Provide quality EMS service and patient care to the county's citizens.
- Provide a means for continuous evaluation to assure policy compliance.

### Procedure:

The following procedures shall be implemented to assure policy compliance:

1. The EMS Unit's priority upon arrival at the medical facility will be to transfer the care of the patient to medical facility staff as soon as possible.
2. EMS personnel will provide a verbal patient report on to the receiving medical facility staff.
3. EMS personnel will provide an interim (PreMIS Preliminary Report or equivalent) or final Patient Care Report (PCR) to the receiving medical facility staff, prior to leaving the facility, that documents at a minimum the patient's evaluation and care provided by EMS prior to arrival at the medical facility. A complete PCR should be completed as soon as possible but should not cause a delay in the EMS Back in Service Time.
4. The EMS Unit will be cleaned, disinfected, and restocked (if necessary) during the EMS Back in Service Time interval.
5. Any EMS Back in Service Time delay resulting in a prolonged EMS Back in Service Time will be documented in Patient Care Report (PCR) as an "EMS Turn-Around Delay" as required and defined in the North Carolina College of Emergency Physicians (NCCEP) EMS Dataset Standards Document.
6. All EMS Turn-Around Delays will be reviewed regularly within the EMS System Peer Review Committee.



## Standards Policy: Operational Policy Section

# EMS Dispatch Center Time



### Policy:

The EMS Dispatch Center Time will be less than 90 seconds, 90% of the time, for all events identified and classified as an emergent or hot (with lights and siren) response.

### Definition:

The EMS Dispatch Center Time is defined as the time interval beginning with the time the initial 911 phone call rings at the 911 Communications Center requesting emergency medical services and ending with the dispatch time of the EMS Unit responding to the event.

### Purpose:

The purpose of this policy is to:

- Provide the safest and most appropriate level of response to all EMS events within the EMS System.
- Provide a timely and reliable response for all EMS events within the EMS System.
- Provide quality EMS service and patient care to the county's citizens.
- Provide a means for continuous evaluation to assure policy compliance.

### Procedure:

The following procedures shall be implemented to assure policy compliance:

1. A public calls into the 911 Communications Center requesting emergency medical assistance will never be required to speak with more than two persons before a formal EMS Unit is dispatched.
2. In EMS Dispatch Centers where Emergency Medical Dispatch (EMD) has been implemented, EMS Units will be dispatched by EMD certified personnel in accordance with the standards developed by the Medical Director and the Emergency Medical Dispatch Protocols.
3. EMS Units will be dispatched hot (with lights and sirens) or cold (no lights and sirens) by the 911 Call Center based on predetermined criteria. If First Responders are dispatched as a component of the EMS response, they should typically be dispatched hot (with lights and sirens).
4. Without question, exception, or hesitation, EMS Units will respond as dispatched (hot or cold). This includes both requests to respond on active calls and requests to "move-up" to cover areas of the System that have limited EMS resources available.
5. EMS Units may, at their discretion, request for a First Responder on Non-First Responder calls in situations where additional resources are required such as manpower, extreme response time of the EMS Unit, need for forcible entry, etc.

## EMS Dispatch Center Time



6. EMS Units dispatched with a cold (no lights and sirens) response, will not upgrade to a hot (with lights and sirens) response **UNLESS**:
  - Public Safety personnel on-scene requests a hot (with lights and sirens) response.
  - Communications Center determines that the patient's condition has changed, and requests you to upgrade to a hot (with lights and sirens) response.
7. An EMS Unit may divert from a current cold (no lights and sirens) call to a higher priority hot (with lights and sirens) call **ONLY IF**:
  - The EMS Unit can get to the higher priority call before it can reach the lower priority call. Examples of High Priority Calls: Chest Pain, Respiratory Distress, CVA, etc.
  - The diverting EMS Unit must notify the EMS Dispatch Center that they are diverting to the higher priority call.
  - The diverting EMS Unit ensures that the EMS Dispatch Center dispatches an EMS Unit to their original call.
  - Once a call has been diverted, the next EMS Unit dispatched must respond to the original call. A call cannot be diverted more than one (1) time.
8. Any EMS Dispatch Center Time delays resulting in a prolonged EMS Dispatch Center Time for emergent hot (with lights and sirens) events will be documented in Patient Care Report (PCR) as an "EMS Dispatch Delay" as required and defined in the North Carolina College of Emergency Physicians (NCCEP) EMS Dataset Standards Document.
9. All EMS Dispatch Delays will be reviewed regularly within the EMS System Peer Review Committee.

Standards Policy: Operational Policy Section

# EMS Wheels Rolling Turn-Out Time



## Policy:

The EMS Wheels Rolling (Turn-out) Time will be less than 90 seconds, 90% of the time, for all events identified and classified as an emergent or hot (with lights and siren) response.

## Definition:

The EMS Wheels Rolling (Turn-out) Time is defined as the time interval beginning with the time the EMS Dispatch Center notifies an EMS Unit to respond to a specific EMS event and ending with the time the EMS Unit is moving en route to the scene of the event.

## Purpose:

The purpose of this policy is to:

- Provide a timely and reliable response for all EMS events within the EMS System.
- Provide quality EMS service and patient care to the county's citizens.
- Provide a means for continuous evaluation to assure policy compliance.

## Procedure:

The following procedures shall be implemented to assure policy compliance:

1. In EMS Dispatch Centers where Emergency Medical Dispatch (EMD) has been implemented, EMS Units will be dispatched by EMD certified personnel in accordance with the standards developed by the Medical Director and the Emergency Medical Dispatch Protocols.
2. The EMS Unit Wheels Rolling (Turn-out) time will be less than 90 seconds from time of dispatch, 90% of the time. If a unit fails to check en route within 2:59 (mm:ss), the next available EMS unit will be dispatched.
3. Without question, exception, or hesitation, EMS Units will respond as dispatched (hot or cold). This includes both requests to respond on active calls and requests to "move-up" to cover areas of the System that have limited EMS resources available.
4. An EMS Unit may divert from a current cold (no lights and sirens) call to a higher priority hot (with lights and sirens) call **ONLY IF**:
  - The EMS Unit can get to the higher priority call before it can reach the lower priority call. Examples of High Priority Calls: Chest Pain, Respiratory Distress, CVA, etc.
  - The diverting EMS Unit must notify the EMS Dispatch Center that they are diverting to the higher priority call.
  - The diverting EMS Unit ensures that the EMS Dispatch Center dispatches an EMS Unit to their original call.
  - Once a call has been diverted, the next EMS Unit dispatched must respond to the original call. A call cannot be diverted more than one (1) time.
5. Any EMS Wheels Rolling (Turn-out) Time delay resulting in a prolonged EMS Response Time for emergent hot (with lights and sirens) events will be documented in Patient Care Report (PCR) as an "EMS Response Delay" as required and defined in the North Carolina College of Emergency Physicians (NCCEP) EMS Dataset Standards Document.
6. All EMS Response Delays will be reviewed regularly within the EMS System Peer Review Committee.

# Equipment Failure



## Policy:

All equipment failures which could or are impacting patient care should be reported immediately to the communications center so that appropriate remedial actions can be taken. All other equipment failures should be reported as soon as possible to the on-duty EMS Supervisor.

## Purpose:

To minimize the impact of equipment failure on patient care.

## Procedure:

1. Each crew shall complete a daily equipment and vehicle check sheet to document the readiness of all equipment and to minimize the risk of such failures. Electronic equipment such as monitors, glucose machines, and thermometers must be checked at the start of every shift.
2. When a critical failure is recognized, contact the appropriate emergency communications center, advise them of the failure, and have the nearest, appropriate EMS resource dispatched. This may be a supervisor, an ambulance, or some other resource, depending upon patient need.
3. Based on the condition of the patient, advise the communications center to send the resource either emergency traffic or non-emergency traffic.
4. Closely monitor and treat the patient to the best of your ability with the remaining functional equipment.
5. Except in unusual circumstances, the original attending provider should continue to provide for the patient until arrival at the hospital, regardless of which unit is actually transporting the patient.
6. While it is appropriate to notify supervisory personnel of the failure at the conclusion of patient care activities, care and transport should not be delayed while awaiting the arrival of a supervisor.

## Failure to Locate



### Policy:

Medical care delays caused by difficulties in finding a dispatch location must be minimized. Personnel who are having trouble finding a dispatch location should immediately ask for assistance. Safeguards are in place to reduce the chances that an unrecognized location failure would have a negative impact on patient care.

### Purpose:

To minimize the impact of geographic response difficulties on patient care.

### Procedure:

1. Each response vehicle is equipped with an up-to-date countywide map book or GPS unit. Each crew shall be familiar with the use of this equipment to accurately plan and execute a response.
2. All field units will acknowledge all radio traffic with their current physical location, and will include the specific location at which they are checking "on scene."
3. When a responder is having trouble finding a dispatch location, they should immediately ask for assistance via radio from the communications center. If other responders are aware of the correct location, they should provide this information via radio.
4. Communications will check on responding units when the response time seems out of proportion to the known response distance.
5. A field unit that is having problems finding a dispatch location should safely pull over to the side of the road and consult their map book. They should not continue to drive, particularly with lights and siren still activated.
6. In extreme circumstances, a field unit should ask for help from other response agencies in finding a dispatch location.
7. If a unit or units have been dispatched to an approximate location for a suspected patient (i.e. a reported crash near mile marker 168 on I-85 Southbound), and they are unable to find an incident or patient, at least two passes by two separate response units should be conducted to make sure the incident or patient has not been missed. These will be documented by verbal report to the communications center.

## Standards Policy: Operational Policy Section

# Fire Rescue Rehab



### **Purpose:**

To aid in the recognition of the significant exertion of responders operating in environmental extremes and to establish a guide for the rest and recuperation of responders during periods of physical exertion when working at emergency scenes or during training evolutions.

### **Procedure:**

#### **Establishment of the Rehab function**

1. For multi-company incidents, the incident commander (IC) is responsible for ensuring a rehab area is established.
2. The IC should be aware of additional rehab resources and should make the request for the resource as early into the incident as possible.
3. If the EMS unit leaves the scene to transport a patient to the hospital, another unit is to be called to the scene.

#### **Rehab location**

4. For warm weather, the rehab area should be set up in a shady area, under a tent, or in an air-conditioned environment.
5. For cold weather, the rehab area should be selected that is out of the wind and provides personnel an opportunity to be dry and warm.
6. A seating area should be provided.
7. The rehab area should be located far enough from scene operations to allow personnel to physically and mentally relax. It should also be free of products of combustion and engine exhaust.
8. The use of tobacco products is prohibited in the rehab area.
9. Consider the use of multiple rehab areas if a geographic feature prevents access to the rehab area by all personnel.
10. The rehab function should be staffed with a minimum of BLS personnel equipped with AED capability. ALS personnel are preferred. An EMS transport unit should be on scene.

#### **Rehab Guidelines –See Protocol 7**

# Infant Abandonment



## Policy:

The North Carolina Infant Homicide Prevention Act provides a mechanism for unwanted infants to be taken under temporary custody by a law enforcement officer, social services worker, healthcare provider, or EMS personnel if an infant is presented by the parent within 7 days of birth. Emergency Medical Services will accept and protect infants who are presented to EMS in this manner, until custody of the child can be released to the Department of Social Services.

*"A law enforcement officer, a department of social services worker, a health care provider as defined in G.S. 90-21.11 at a hospital or local or district health department, or an **emergency medical technician** at a fire station shall, without a court order, take into temporary custody an infant under 7 days of age that is voluntarily delivered to the individual by the infant's parent who does not express an intent to return for the infant. An individual who takes an infant into temporary custody under this subsection shall perform any act necessary to protect the physical health and well-being of the infant and shall immediately notify the department of social services. Any individual who takes an infant into temporary custody under this subsection may inquire as to the parents' identities and as to any relevant medical history, but the parent is not required to provide this information."*

## Purpose:

To provide:

- Protection to infants that are placed into the custody of EMS under this law
- Protection to EMS systems and personnel when confronted with this issue

## Procedure:

1. Initiate the Pediatric Assessment Procedure.
2. Initiate Newly Born Protocol as appropriate.
3. Initiate other treatment protocols as appropriate.
4. Keep infant warm.
5. As soon as the infant is stabilized call local Department of Social Services at 919-968-2000. After office hours, the adult service social worker on call can be contacted by the 9-1-1 communications center.
6. Transport infant to medical facility as per local protocol.
7. Assure infant is secured in appropriate child restraint device for transport.
8. Document protocols, procedures, and agency notifications in the PCR.

# Physician On-Scene

**Policy:**

The medical direction of prehospital care at the scene of an emergency is the responsibility of those most appropriately trained in providing such care. All care should be provided within the rules and regulations of the state of North Carolina.

**Purpose:**

- To identify a chain of command to allow field personnel to adequately care for the patient
- To assure the patient receives the maximum benefit from prehospital care
- To minimize the liability of the EMS system as well as the on-scene physician

**Procedure:**

1. When a non medical-control physician offers assistance to EMS or the patient is being attended by a physician with whom they do not have an ongoing patient relationship, EMS personnel must review the On-Scene Physician Form with the physician. All requisite documentation must be verified and the physician must be approved by on-line medical control.
2. When the patient is being attended by a physician with whom they have an ongoing patient relationship, EMS personnel may follow orders given by the physician if the orders conform to current EMS guidelines, and if the physician signs the PCR. Notify medical control at the earliest opportunity. Any deviation from local EMS protocols requires the physician to accompany the patient to the hospital.
3. EMS personnel may accept orders from the patient's physician over the phone with the approval of medical control. The paramedic should obtain the specific order and the physician's phone number for relay to medical control so that medical control can discuss any concerns with the physician directly.





Standards Policy: Medical Policy Section

# Safe Transport of Pediatric Patients



## Policy:

Without special considerations children are at risk of injury when transported by EMS. EMS must provide appropriate stabilization and protection to pediatric patients during EMS transport.

## Purpose:

To provide:

- Provide a safe method of transporting pediatric patients within an ambulance.
- Protect the EMS system and personnel from potential harm and liability associated with the transportation of pediatric patients.

## Procedure:

1. Drive cautiously at safe speeds observing traffic laws.
2. Tightly secure all monitoring devices and other equipment.
3. Insure that all pediatric patient less than 40 lbs are restrained with an approved child restraint device secured appropriately to the stretcher or captains chair.
3. Insure that all EMS personnel use the available restraint systems during the transport.
4. Transport adults and children who are not patients, properly restrained, in an alternate passenger vehicle, whenever possible.
5. Do not allow parents, caregivers, or other passengers to be unrestrained during transport.
6. NEVER attempt to hold or allow the parents or caregivers to hold the patient during transport.

# Terrorism Response

**Policy:**

EMS providers will respond to every call for assistance with eyes open and heightened awareness of the possibility of terrorist threats.

**Purpose:**

The purpose of this policy is to increase awareness of possible terrorist incidents as EMS responds to calls for assistance.

**Procedure:**

1. Terrorism is defined in the *Code of Federal Regulations* as "...the unlawful use of force and violence against persons or property to intimidate or coerce a government, the civilian population, or any segment thereof, in furtherance of political or social objectives." (28 C.F.R. Section 0.85)
2. Domestic terrorism refers to activities that involve acts dangerous to human life that are a violation of the criminal laws of the United States or of any state; appear to be intended to intimidate or coerce a civilian population; to influence the policy of a government by mass destruction, assassination, or kidnapping; and occur primarily within the territorial jurisdiction of the United States. [18 U.S.C. § 2331(5)]
3. A terrorist *incident* is a violent act or an act dangerous to human life, in violation of the criminal laws of the United States, or of any state, to intimidate or coerce a government, the civilian population, or any segment thereof, in furtherance of political or social objectives.
4. The recognition of a terrorist incident depends on alert field providers.
5. There are several types of terrorist incidents:
  - a. Biological: Several types of biological agents exist but these can be grouped into bacteria, viruses, and toxins.
    1. Indicators:
      - i. Unusual number of sick or dying people or animals
      - ii. Dissemination of unscheduled and unusual sprays, especially outdoors or at night
      - iii. Abandoned spray devices with no distinct odors
  - b. Nuclear: There major types of radiation particles are of concern – alpha, beta, and gamma. Time, distance, and shielding are most important in determining cumulative dose.
    1. Indicators:
      - i. Recognition of DOT placards and labels
      - ii. Obvious accident or actual detonation
      - iii. Use of monitoring devices



## Terrorism Response

- c. Incendiary: Fire-starting devices of a mechanical, electrical, or chemical nature
  - 1. Indicators:
    - i. Multiple fires
    - ii. Remains of incendiary device components
    - iii. Odors of accelerants
    - iv. Heavy burning or high fire volume
- d. Chemical: Five basic categories exist – nerve agents, blister agents, blood agents, choking agents, and irritant agents.
  - 1. Indicators:
    - i. Rapid onset of similar symptoms in large groups of people
    - ii. Clammy skin and pinpoint pupils
    - iii. Mass fatalities without other signs of trauma
    - iv. Hazardous materials or lab equipment not relevant to occupancy
    - v. Unscheduled dissemination of unusual sprays
    - vi. Abandoned spray devices
    - vii. Numerous dead animals, fish, and birds, absence of insect life
    - viii. Distinct pattern of casualties and common symptoms
- e. Explosive
  - 1. Indicators
    - i. Usually obvious large scale damage to structure
    - ii. Blown-out windows and widely scattered debris
    - iii. Usually many civilian casualties and fatalities

2. It is critical that EMS personnel be alert to the potential for terrorist incidents and be prepared to respond appropriately.

**\*\*Note:** this policy was derived from and closely follows the Iowa Department of Public Health Bureau of EMS Guidelines for EMS Response to Terrorist



# Transport

## Policy:

All individuals served by the EMS system will be evaluated, treated, and furnished transportation (if indicated) in the most timely and appropriate manner for each individual situation.

## Purpose:

To provide:

- Rapid emergency EMS transport when needed.
- Appropriate medical stabilization and treatment at the scene when necessary
- Protection of patients, EMS personnel, and citizens from undue risk when possible.

## Procedure:

1. All trauma patients with significant mechanism or history for multiple system trauma will be transported as soon as possible. The scene time should be 10 minutes or less.
2. All acute Stroke and acute ST-Elevation Myocardial Infarction patients will be transported as soon as possible. The scene time should be 10 minutes or less for acute Stroke patients and 15 minutes or less (with 12 Lead ECG) for STEMI patients
2. Other Medical patients will be transported in the most efficient manner possible considering the medical condition. Advanced life support therapy should be provided at the scene if it would positively impact patient care. Justification for scene times greater than 20 minutes should be documented.
3. No patients will be transported in initial response non-transport vehicles.
4. In unusual circumstances, transport in other vehicles may be appropriate when directed by EMS administration.



# Transport Destination

## Purpose:

To establish where Orange County 911-system ambulance crews can transport all patients regardless of pick-up location.

## Policy:

1. EMS will only transport patients directly to these facilities regardless of pick-up location:
  - Emergency Departments
  - Catheterization lab
  - Labor and delivery
  - NICU
  - An approved alternative destination
2. Please consult the Alternative Destination Protocol for approved alternative destination locations.
3. Providers are to consult with the EMS Supervisor if necessary. EMS Supervisors will be notified if an Orange County system ambulance is requested to respond to the UNC Hillsborough campus.
4. Quality Assurance will review 100% of patients that are transported from UNC Hillsborough ED, or to an approved alternative destination, or catheterization lab.
4. EMS providers will be expected to provide care inside their scope of practice as documented in the NCEP Standards EMS Medication and Skill Use.
5. In the setting of an interfacility transfer the provider may deem the patient care has occurred beyond their scope of practice, a clear communication between the attending physician and provider should occur. A discussion between physician and provider of alternative means of transport or additional resources should occur. The paramedic will ensure that the physician understands their scope of practice and the physician can assume care while in transport.
6. The paramedic shall complete a full PCR on the transferred patient and shall select the appropriate pick up and destination.
7. The paramedic shall provide a radio report to the receiving facility.

Standards Policy: Operational Policy Section

# UNC ED Interfacility Transfer



**Purpose:**

To establish the role of an Orange County 911-system ambulance crews in the event of an interfacility transfer from UNC Hillsborough ED to UNC Main Campus ED

**Policy:**

1. Carolina Air Care is the primary transport agency for transfers from the UNC Hillsborough Campus to the UNC Main Campus.
2. In critical need or resource deficiency, an Orange County System ambulance will be requested.
3. UNC Hillsborough ED and UNC Main Campus ED are part of the same integrated healthcare system and provide medical control for the Orange County EMS System.
4. EMS Supervisors will be notified if an Orange County system ambulance is requested to respond to the UNC Hillsborough campus.
5. The Quality Assurance Officer will be notified regarding any transfer from the Hillsborough campus ED to the main campus ED.
6. EMS providers will be expected to provide care inside their scope of practice as documented in the NCEP Standards EMS Medication and Skill Use.
7. In the event that the provider deems the patient too unstable or care has occurred beyond their scope of practice, a clear communication between the attending physician and provider should occur. The paramedic will ensure that the physician understands their scope of practice and resource limitations.
8. The paramedic shall complete a full PCR on the transferred patient and shall select the appropriate pick up and destination.
9. The paramedic shall provide a radio report to the receiving facility.
10. Orange County EMS system ALS ambulances will not be utilized to transport patients from the UNC Main Campus to the UNC Hillsborough Campus.

# Standards Policy: Operational Policy Section

## Service Animal Transport



### History

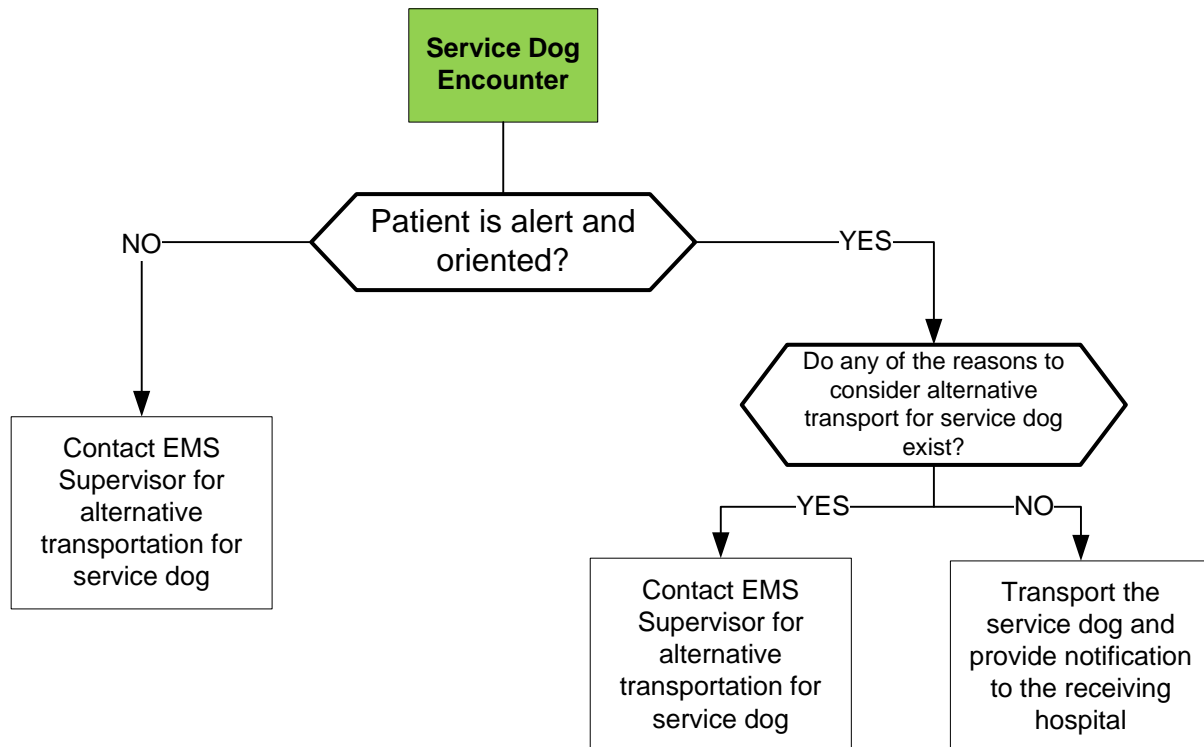
- The American with Disabilities ACT requires that all entities must allow service animals to accompany people with disabilities in all areas of the facility where the public is normally allowed to go
- The ADA only recognizes dogs and miniature horses as service animals

### Glossary

- Service Animal = any dog that is individually trained to do work or perform tasks for the benefit of an individual with a disability, including a physical, sensory, psychiatric, intellectual or other mental disability.
- Work or Tasks = specific actions when needed to assist the person with a disability

### Reasons to consider alternative transport for service dog

- Patient is unconscious or is unable to care for the service dog
- Service dog is demonstrating aggressive or destructive behavior
- If space in the ambulance is crowded and/or the dog's presence would interfere with the ability to treat the patient
- If the handler does not have the dog under control of a harness, leash or tether and one is not available.



### Pearls

- When you are unsure if the dog is a service animal, you may ask two questions: (1) is the dog a service animal required because of a disability, and (2) what work or task has the dog been trained to perform. We cannot ask about the person's disability, require medical documentation, require a special identification card or training documentation for the dog, or ask that the dog demonstrate its ability to perform the work or task.
- EMS crews must document disposition of the service animal in patient care report
- Regardless of who transports the dog, the owner and the service animal should arrive at the hospital at the same time
- Ambulances are only required to accommodate service dogs, and ambulance crews can legally deny transporting all other types of animals
- The decision to allow the patient and animal to remain together ultimately rests with the crew, and is based on the patient's need and ability to control the animal, as well as the crew's ability to transport the dog safely.
- Alternative mechanisms of transporting the service dog are police, animal control, EMS Supervisor, a friend, family member, or neighbor
- If transporting the service dog, the dog should be tethered to a stationary object in the ambulance, i.e. the stretcher, bench seat seatbelt, etc.
- Cover sharp object in perforated running boards to ensure dogs paws are not injured
- If a care provider for the patient has a service dog and requests to ride with a patient, use the same considerations as above to make decisions regarding transport. It is preferable to have the care provider's service animal in cab under the control of the care provider.
- For further information please review: [www.ADA.gov](http://www.ADA.gov)



# **Documentation Policies**

## Standards Policy: Documentation Policy Section

# Child Abuse Recognition and Reporting



### Policy:

Child abuse is the physical and mental injury, sexual abuse, negligent treatment, or maltreatment of a child under the age of 18 by a person who is responsible for the child's welfare. The recognition of abuse and the proper reporting is a critical step to improving the safety of children and preventing child abuse.

### Purpose:

Assessment of a child abuse case based upon the following principles:

- **Protect** the life of the child from harm, as well as that of the EMS team from liability.
- **Suspect** that the child may be a victim of abuse, especially if the injury/illness is not consistent with the reported history.
- **Respect** the privacy of the child and family.
- **Collect** as much evidence as possible, especially information.

### Procedure:

1. With all children, assess for and document psychological characteristics of abuse, including excessively passivity, compliant or fearful behavior, excessive aggression, violent tendencies, excessive crying, fussy behavior, hyperactivity, or other behavioral disorders
2. With all children, assess for and document physical signs of abuse, including especially any injuries that are inconsistent with the reported mechanism of injury.
3. With all children, assess for and document signs and symptoms of neglect, including inappropriate level of clothing for weather, inadequate hygiene, absence of attentive caregiver(s), or physical signs of malnutrition.
4. Immediately report any suspicious findings to both the receiving hospital (if transported) and to agency responsible for Social Services in the county. After office hours, the child protective services worker on call can be contacted by the EMS System's 911 communications center. While law enforcement may also be notified, North Carolina law requires the EMS provider to report the suspicion of abuse to DSS. EMS should not accuse or challenge the suspected abuser. This is a legal requirement to report, not an accusation. In the event of a child fatality, law enforcement must also be notified.

Standards Policy: Medical Policy Section

# Children with Special Healthcare Needs (NC Kidbase)



## Policy:

Medical technology, changes in the healthcare industry, and increased home health capabilities have created a special population of patients that interface with the EMS system. It is important for EMS to understand and provide quality care to children with special health care needs.

## Purpose:

The purpose of this policy is to:

- Provide quality patient care and EMS services to children with special health care needs.
- Understand the need to communicate with the parents and caregivers regarding healthcare needs and devices that EMS may not have experience with.
- Promote, request, and use the "Kidbase" form, which catalogs the health care problems, needs, and issues of each child with a special healthcare need.

## Procedure:

1. Caregivers who call 911 to report an emergency involving a child with special health care needs may report that the emergency involves a "Kidbase child" (if they are familiar with the NC Kidbase program) or may state that the situation involves a special needs child.
2. Responding EMS personnel should ask the caregiver of a special needs child for a copy of the "Kidbase Form", which is the North Carolina terminology for the Emergency Information Form (EIF).
3. EMS personnel may choose to contact the child's primary care physician for assistance with specific conditions or devices or for advice regarding appropriate treatment and/or transport of the child in the specific situation.
4. Transportation of the child, if necessary, will be made to the hospital appropriate for the specific condition of the child. In some cases this may involve bypassing the closest facility for a more distant yet more medically appropriate destination.

## Standards Policy: Documentation Policy Section

# Disposition (Patient Instructions)



### Policy:

All patient encounters responded to by EMS will result in the accurate and timely completion of:

- The Patient Care Report (PCR) for all patients transported by EMS
- The Patient Disposition Form for all patients not transported by EMS

### Purpose:

To provide for the documentation of:

- The evaluation and care of the patient
- The patient's refusal of the evaluation, treatment, and/or transportation
- The patient's disposition instructions
- The patient's EMS encounter to protect the local EMS system and its personnel from undue risk and liability.

### Procedure:

1. All patient encounters, which result in some component of an evaluation, must have a Patient Care Report completed.
2. All patients who refuse any component of the evaluation or treatment, based on the complaint, must have a Disposition Form completed.
3. All patients who are NOT transported by EMS must have a Disposition (patient instruction) Form completed including the Patient Instruction Section.
4. A copy of the Patient Disposition Form should be maintained with the official Patient Care Report (PCR)

# Standards Policy: Documentation Policy Section

## Do Not Resuscitate and Most Form



### Policy:

Any patient presenting to any component of the EMS system with a completed **North Carolina Do Not Resuscitate (DNR)** form (yellow form) and/or **MOST (Medical Orders for Scope of Treatment)** form (bright pink form) shall have the form honored. Treatment will be limited as documented on the DNR or MOST form.

### Purpose:

- To honor the terminal wishes of the patient
- To prevent the initiation of unwanted resuscitation

### Procedure:

1. When confronted with a patient or situation involving the NC DNR and/or MOST form(s), the following form content must be verified before honoring the form(s) request.
  - The form(s) must be an original North Carolina DNR form (yellow form - not a copy) and/or North Carolina MOST form (bright pink – not a copy)
  - The effective date and expiration date must be completed and current
  - The DNR and/or MOST Form must be signed by a physician, physician's assistant, or nurse practitioner.
2. A valid DNR or MOST form may be overridden by the request of:
  - The patient
  - The guardian of the patient
  - An on-scene physician

If the patient or anyone associated with the patient requests that a NC DNR and/or MOST form not be honored, EMS personnel should contact **Medical Control** to obtain assistance and direction

3. A living will or other legal document that identifies the patient's desire to withhold CPR or other medical care may be honored with the approval of **Medical Control**. This should be done when possible in consultation with the patient's family and personal physician.

## Standards Policy: Documentation Policy Section

# Documentation and Data Quality



### Policy:

The complete EMS documentation associated with an EMS events service delivery and patient care shall be electronically recorded into a Patient Care Report (PCR) within 24 hours of the completion of the EMS event with an average EMS Data Score of 5 or less.

### Definition:

The EMS documentation of a Patient Care Report (PCR) is based on the appropriate and complete documentation of the EMS data elements as required and defined within the North Carolina College of Emergency Physician's EMS Standards ([www.NCCEP.org](http://www.NCCEP.org)). Since each EMS event and/or patient scenario is unique, only the data elements relevant to that EMS event and/or patient scenario should be completed.

The EMS Data Score is calculated on each EMS PCR as it is electronically processed into the North Carolina PreHospital Medical Information System (PreMIS). Data Quality Scores are provided within PreMIS and EMS Toolkit Reports. The best possible score is a 0 (zero) and with each data quality error a point is added to the data quality score.

A complete Patient Care Report (PCR) must contain the following information (as it relates to each EMS event and/or patient):

- Service delivery and Crew information regarding the EMS Agency's response
- Dispatch information regarding the dispatch complaint, and EMD card number
- Patient care provided prior to EMS arrival
- Patient Assessment as required by each specific complaint based protocol
- Past medical history, medications, allergies, and DNR/MOST status
- Trauma and Cardiac Arrest information if relevant to the EMS event or patient
- All times related to the event
- All procedures and their associated time
- All medications administered with their associated time
- Disposition and/or transport information
- Communication with medical control
- Appropriate Signatures (written and/or electronic)

### Purpose:

The purpose of this policy is to:

- Promote timely and complete EMS documentation.
- Promote quality documentation that can be used to evaluate and improve EMS service delivery, personnel performance, and patient care to the county's citizens.
- Promote quality documentation that will decrease EMS legal and risk management liability.
- Provide a means for continuous evaluation to assure policy compliance.

## Standards Policy: Documentation Policy Section

# Documentation and Data Quality



### Procedure:

The following procedures shall be implemented to assure policy compliance:

1. The EMS Patient Care Report (PCR) shall be completed as soon as possible after the time of the patient encounter. **Documentation should be completed prior to leaving the destination facility unless call demand dictates otherwise, in which case documentation must be completed prior to the end of the personnel's shift.**
2. **A copy of the patient care report form SHOULD be provided to the receiving medical facility. If the final PCR is not available at the time the patient is left with the emergency department or other healthcare facility, an interim report such as the PreMIS Preliminary Report Form MUST be provided.**
3. The PCR must be completed in the PreMIS System or electronically submitted to the PreMIS System within 24 hours of the EMS event or patient encounter's completion. The EMS data quality feedback provided at the time of the electronic submission into PreMIS should be reviewed and when possible any identified errors will be corrected within each PCR. Each PCR may be electronically resubmitted to PreMIS as many times as needed.
4. The EMS Data Quality Scores for the EMS System, EMS Agency, and individual EMS personnel will be reviewed regularly within the EMS System Peer Review Committee.

# Documentation of Vital Signs



## Policy:

Every patient encounter by EMS will be documented. Vital signs are a key component in the evaluation of any patient and a complete set of vital signs is to be documented for any patient who receives some assessment component.

## Purpose:

To insure:

- Evaluation of every patient's volume and cardiovascular status
- Documentation of a complete set of vital signs

## Procedure:

1. An **initial** complete set of vital signs includes:
  - Pulse rate
  - Systolic **AND** diastolic blood pressure
  - Respiratory rate
  - Pain / severity (when appropriate to patient complaint)
  - GCS for Injured Patients
2. When no ALS treatment is provided, palpated blood pressures are acceptable for **REPEAT** vital signs.
3. Based on patient condition and complaint, vital signs may also include:
  - Pulse Oximetry
  - Temperature
  - End Tidal CO2 (If Invasive Airway Procedure)
  - Breath Sounds
  - Level of Response
4. If the patient refuses this evaluation, the patient's mental status and the reason for refusal of evaluation must be documented. A patient disposition form must also be completed.
5. Document situations that preclude the evaluation of a complete set of vital signs.
6. Record the time vital signs were obtained.
7. Any abnormal vital sign should be repeated and monitored closely.



Standards Policy: Documentation Policy Section

# Domestic Violence (Partner and/or Elder Abuse)

## Recognition and Reporting



### Policy:

Domestic violence is physical, sexual, or psychological abuse and/or intimidation, which attempts to control another person in a current or former family, dating, or household relationship. The recognition, appropriate reporting, and referral of abuse is a critical step to improving patient safety, providing quality health care, and preventing further abuse.

Elder abuse is the physical and/or mental injury, sexual abuse, negligent treatment, or maltreatment of a senior citizen by another person. Abuse may be at the hand of a caregiver, spouse, neighbor, or adult child of the patient. The recognition of abuse and the proper reporting is a critical step to improve the health and wellbeing of senior citizens.

### Purpose:

Assessment of an abuse case based upon the following principles:

- **Protect** the patient from harm, as well as protecting the EMS team from harm and liability.
- **Suspect** that the patient may be a victim of abuse, especially if the injury/illness is not consistent with the reported history.
- **Respect** the privacy of the patient and family.
- **Collect** as much information and evidence as possible and preserve physical evidence.

### Procedure:

1. Assess the/all patient(s) for any psychological characteristics of abuse, including excessive passivity, compliant or fearful behavior, excessive aggression, violent tendencies, excessive crying, behavioral disorders, substance abuse, medical non-compliance, or repeated EMS requests. This is typically best done in private with the patient.
2. Assess the patient for any physical signs of abuse, especially any injuries that are inconsistent with the reported mechanism of injury. Defensive injuries (e.g. to forearms), and injuries during pregnancy are also suggestive of abuse. Injuries in different stages of healing may indicate repeated episodes of violence.
3. Assess all patients for signs and symptoms of neglect, including inappropriate level of clothing for weather, inadequate hygiene, absence of attentive caregiver(s), or physical signs of malnutrition.
4. Immediately report any suspicious findings to both the receiving hospital (if transported). If an elder or disabled adult is involved, also contact the Department of Social Services (DSS) or equivalent in the county. After office hours, the adult social services worker on call can be contacted by the 911 communications center.
5. EMS should contact the Department of Social Services if children are in the home and domestic violence is suspected, even if the child does not appear involved.
6. EMS personnel should attempt in private to provide the patient with the phone number of the local domestic violence program, or the **National Hotline, 1-800-799-SAFE**.
7. Immediately report any suspicious findings to both the receiving hospital (if transported) and to the Department of Social Services at 919-968-2000. After office hours, the adult service social worker on call can be contacted by the 9-1-1 communications center.



# Protocol Adherence

## Policy:

Protocols are treatment guidelines that provide a framework for patient care. Personnel are expected to apply their training to provide excellent care for patients. No written guideline can address every possible situation or patient condition, and Orange County EMS personnel are expected to put the patient's interest first. Deviation from established protocol should be documented and discussed with the Medical Director at the earliest convenience.

Protocols are designed to enable provision of the most appropriate EMS care based on the each patient's needs. The advanced differential and disposition components of each protocol are based on a defined program of initial training, continuing education, and ongoing quality management. Use of these protocols in any system outside of Orange County Emergency Medical Services is unproved and may result in an undue risk to the patient and to the EMS system as well as personnel involved.

## Purpose:

The purpose of this policy is to:

- Improve patient care in the prehospital setting
- Improve quality management
- Ensure compliance to protocols

## Procedure:

1. Assessment and Treatment for all patient encounters should be initiated based on the Orange County EMS Protocols.
2. All treatment should include the Universal Patient Care Protocol ([protocol 01](#)).
3. When possible, there should be discussion with **Medical Control** prior to any deviation from established protocols. If not immediately possible, the technician(s) should thoroughly document the situation, notify their supervisor, and discuss the incident with the Medical Director at the earliest possible time.
4. Unless otherwise authorized by the Medical Director, the Orange County NC EMS Protocols are for the use of personnel practicing as part of the Orange County NC EMS System. The use of these protocols outside of the scope of the Orange County EMS System is illegal and potentially dangerous.
5. Failure to comply with this policy may result in disciplinary action as described in the Orange County NC EMS Medical Disciplinary procedure.



# Referral

## Policy:

All patients who are evaluated and not transported by Orange County EMS must be provided with an appropriate referral. A disposition (patient discharge instruction form) form including the patient instruction section will be completed for these patients.

## Purpose:

The purpose of this policy is to:

- Provide for appropriate referral of patients
- Protect against liability for the EMS system

## Procedure:

1. After completing a thorough medical evaluation of the patient, appropriate referrals are made with compliance to the corresponding protocol.
2. Appropriate documentation of the referral form includes the following:
  - a. Time frame in which the patient should see a physician.
  - b. To whom the patient is being released.
  - c. Patient Discharge instructions.
  - d. Any other pertinent instructions relating to referral decision.
3. Decision to refer a patient to alternative destinations should be medically directed and follow established Orange County protocols. The decision not to transport a patient to the emergency department should never be financially motivated or system-driven.
4. Any suggestion or discussion of alternatives that results in a destination other than the emergency department is a referral.
5. When a referral is indicated, EMS will offer to the patient all available options for the disposition according to protocols. Patients electing EMS transport will be transported.
6. Patients who are not transported via EMS will be given written instructions.

# Refusal

**Policy:** Refusal of Care, Transportation, or Recommended Destination

**Purpose:** To establish guidelines for the management and documentation of situations where patients refuse treatment or transportation, or insist on transportation to a destination other than that recommended by the ambulance personnel.

**Procedure:****I. Patient Assessment**

- A. Providers should attempt to obtain a history and physical, in as much detail as is permitted by the patient.
- B. Conduct Three Assessments: Providers should attempt to assess three major areas prior to permitting a patient to refuse care and/or transportation:
  - 1. Legal competence
    - a. Ensure that patients is at least 18 years of age in order to refuse care
    - b. Or, if a minor, patient may refuse care if he or she is an emancipated minor, has a military ID, or is pregnant
    - c. Patients subject to a court decree of incapacity are not legally competent to refuse care
  - 2. Mental competence
    - a. Start with the presumption that all patients are mentally competent unless your assessment clearly indicates otherwise
    - b. Ensure that patient is oriented to person, place, time and purpose
    - c. Establish that patient is not a danger to himself or others
    - d. Ensure that patient is capable of understanding the risks of refusing care or transportation and any proposed alternatives
    - e. Check to be sure that patient is exhibiting no other signs or symptoms of potential mental incapacity as defined in the altered mental status protocol (19).
  - 3. Medical or situational competence
    - a. Ensure that patient is suffering from no acute medical conditions that might impair his or her ability to make an informed decision to refuse care or transportation
    - b. If possible, rule out conditions described in the altered mental status protocol (19).
    - c. Attempt to determine if patient lost consciousness for any period of time.
    - d. If any conditions in (a) – (c) impair patient's decision making ability, patient may not be competent to refuse care and your documentation should clearly establish that the patient understood the risks, benefits and advice given to him.

# Refusal



## II. Medical Control

A. Contact medical control if you believe patient is in need of further medical attention yet refuses care; medical control may be able to help persuade patient

## III. Who May Refuse Care

### A. The patient

1. If patient is legally, mentally and situationally competent, the patient has a right to refuse care. Obtain refusal signature.
2. Implied consent -- if patient is unconscious or otherwise unable to refuse care due to conditions listed in section I and they are in need of further medical attention, treat and transport patient

### B. Parent

1. A custodial parent (i.e. A parent with a legal right to custody of a minor child) may refuse care on behalf of a minor child. Obtain refusal signature from parent.
2. A parent of a patient who is 18 years of age or older may not refuse care on behalf of his or her child (unless the parent also happens to be a legal guardian – see below)
3. A minor (i.e., under 18 years of age) may refuse care for his or her child. Obtain refusal signature from the minor parent.
4. If a person indicates they are the parent of the patient, an attempt should be made to obtain identification or proof of kinship. If no such documentation is available, you may obtain refusal signature from the guardian as long as you do so in good faith and do not have any evidence or knowledge that the person is misrepresenting himself as a legal guardian of the patient.

### C. Guardian

1. A legal guardian is one who is appointed by a court to act as “guardian of the person” of an individual who has been found by a court to be incapacitated
2. Legal guardian may also be appointed in lieu of parents for a minor
3. If a person indicates they are a legal guardian to the patient, attempt to obtain documentation of this fact (court order, etc.) to be attached to the ePCR. If no such documentation is available, you may obtain refusal signature from the guardian as long as you do so in good faith and do not have any evidence or knowledge that the person is misrepresenting himself as a legal guardian of the patient.

### D. Health Care Agent

1. A person appointed by the patient in a durable power of attorney document may refuse care on behalf of the patient if the power of attorney contains such authorization.
2. Attempt to obtain a copy of the durable power of attorney document to be attached to the ePCR. If no such documentation is available, you may obtain refusal signature from a health care agent as long as you do so in good faith and do not have any evidence or knowledge that the person is misrepresenting himself as the health care agent of the patient.



# Refusal

## E. Incompetent Patient

1. If patient is incompetent, and no other authorized individual is available to provide a refusal signature, patient may be treated and transported as long as you act in good faith and without knowledge that the patient or authorized individual would refuse care.
2. Take all reasonable steps to secure treatment or transportation for a patient who is legally or mentally incompetent to refuse care, but do not put yourself or your crew in jeopardy.

# Standards Policy: Disposition Policy Section

## ESO Disposition Guidelines



### Definition of a Patient:

A patient is any individual requesting or potentially needing medical evaluation, treatment, or assistance – obvious or perceived. The patient – provider relationship is established at the request for service, regardless of medium or scope of request. It is the provider’s responsibility to ensure all potential patients, regardless of the size of the incident, are offered assistance, and the opportunity for evaluation, treatment, and/or transport.

#### What is NOT a patient?

In situations where a third party calls and a person states they do not require EMS or are refusing an evaluation. This is particularly relevant on MVCs. Blood Draws without complaints are regarded as non-patient contacts, but require PCR documentation.

**Providers in the OCEMS System are expected to obtain basic demographic information and vital signs when encountering a potential patient, even for a simple “Lift Assist” call.** While not all people encountered will be patients, all patients require a complete evaluation.

<u>What Requires an ePCR?</u>	<u>What does NOT Require an ePCR?</u>
<ul style="list-style-type: none"><li>• When any form of clinical assessment or evaluation of a patient or potential patient occurred</li><li>• When any treatment or transportation was rendered</li><li>• On any dispatch call that resolves in cancellation, and providers made an effort to respond, or arrived on scene</li><li>• Any Standby Event, including community outreach events</li></ul>	<ul style="list-style-type: none"><li>• If you are dispatched to an incident, but another unit assumes the incident</li><li>• If you are responding to an in County “Move Up” for coverage</li><li>• If you are not responding to an incident</li><li>• If you are assisting another unit on scene, and do not encounter additional patients</li></ul>

### Additional Definitions:

**Vital Signs:** *At a minimum*, this term refers to obtaining a patient’s **GCS, level of responsiveness, heart rate, respiratory rate, pulse oximetry, and blood pressure**. Vital signs may also include: Blood Glucose, Temperature, End Tidal CO<sub>2</sub>, and Pain Score if indicated. Omission of any vital sign(s) must be documented and explained in the narrative.

# Standards Policy: Disposition Policy Section

## ESO Disposition Guidelines



### Patient Transport Dispositions

ESO Disposition	Definition	Example(s)	Signature(s) Required	Vital Signs Required?
<b>TRANSPORTED NO LIGHTS / SIREN</b>	Used when a patient is transported to the emergency department without emergency lights and sirens.	Medic 4 has emergency warning signals off while enroute to the hospital.	<b>Provider AND Billing Authorization (Sections I, II, or III)</b>	<b>YES</b>
<b>TRANSPORTED LIGHTS / SIREN</b>	Used when a patient is transported to the emergency department with emergency lights and sirens.	Medic 6 has emergency warning signals on while enroute to the hospital.	<b>Provider AND Billing Authorization (Sections I, II, or III)</b>	<b>YES</b>
<b>TRANSPORTED NO LIGHTS / SIREN, UPGRADED</b>	Used when a patient is transported to the emergency department begins without lights and sirens, but ends with emergency lights and sirens.	Medic 9 begins transport with emergency lights and siren off, but turns emergency warning signals on while enroute to the hospital.	<b>Provider AND Billing Authorization (Sections I, II, or III)</b>	<b>YES</b>
<b>PATIENT REFUSED EVALUATION / CARE (WITH TRANSPORT)</b>	Used when a patient is transported, but refuses specific procedures, medications, or destination.	Medic 1 is transporting a patient to the hospital, but the patient refuses OCEMS destination plans or protocol interventions. Trauma patient refusing appropriate destination. STEMI patient refusing Aspirin.	<b>Provider AND Billing Authorization (Sections I, II, or III) AND Refusal Form</b>	<b>YES</b>



# Standards Policy: Disposition Policy Section

## ESO Disposition Guidelines



### Patient Non-Transport Dispositions

ESO Disposition	Definition	Example(s)	Signature Type	Vital Signs Required?
<b>PATIENT REFUSED EVALUATION / CARE (WITHOUT TRANSPORT)</b>	The patient has declined any or all components of EMS Care or Evaluation <b>AND</b> Transportation in the setting of a potential traumatic injury or medical problem.	Medic 3 is with a potential patient who refuses and declines any EMS care, including an assessment. Especially useful on MVA scenes.	<b>Provider AND Refusal Form</b>	<b>Attempt</b>
<b>PATIENT TREATED, RELEASED AMA</b>	This disposition is for the patient that has received EMS care and evaluation, but refuses subsequent EMS treatment <b>AND</b> transportation <b><u>against the EMS provider's strong recommendation.</u></b>	The Against Medical Advice Patient receives an assessment or intervention, but refuses additional care and / or transportation. <b>EMS Supervisors and Medical Direction should be consulted with these High Risk Refusals.</b>	<b>Provider AND Refusal Form</b>	<b>YES</b>
<b>PATIENT TREATED, RELEASED (PER PROTOCOL)</b>	Used when a patient is treated and released per an <b><u>OCEMS Referral protocol.</u></b>	Patient fulfills an OCEMS referral pathway, and no transport is recommended or requested.	<b>Provider AND Billing Authorization (Section I)</b>	<b>YES</b>
<b>PATIENT TREATED, TRANSFERRED CARE TO OTHER EMS PROFESSIONAL</b>	This disposition is used when a provider initiates care, then patient care is turned over to another unit <b>from another System</b> for transport and further treatment.	Patient cared for on scene, and care is transferred to Air Medical. Unit breaks down enroute to Duke, and Durham completes transport.	<b>Provider</b>	<b>YES</b>
<b>PATIENT DEAD ON SCENE - RESUSCITATION ATTEMPTED (WITHOUT TRANSPORT)</b>	This disposition is used if any attempt is made at resuscitation, and the attempt is subsequently discontinued on scene.	Typical Code worked and called on scene after ALS resuscitation has been terminated.	<b>Provider</b>	<b>YES</b>

# Standards Policy: Disposition Policy Section

## ESO Disposition Guidelines



<b>PATIENT DEAD ON SCENE - NO RESUSCITATION ATTEMPTED (WITHOUT TRANSPORT)</b>	This disposition is used if there is no attempt made at resuscitation.	Patient found pulseless / apneic, resuscitation attempts are deemed futile, and patient meets Policy 4, "Criteria for Death / Withholding Resuscitation".	Provider	N/A
<b>Non-Patient Dispositions</b>				
ESO Disposition	Definition	Example(s)	Signature Type	Vital Signs Required?
<b>ASSIST, PUBLIC</b>	Request for Service that are not medical in nature. Persons must be offered and decline medical evaluation <u>with documentation</u> , and have a non-medical request.	BLS 3 is dispatched to the non-traumatic lift assist that denies injury and declines assessment.	Provider	Attempt
<b>CANCELLED (PRIOR TO ARRIVAL AT SCENE)</b>	Use this disposition when the EMS response is cancelled by dispatch or another unit (Fire, Law Enforcement, or other EMS unit) already on scene prior to arrival at the scene.	Medic 2 is cancelled enroute, 911 advises the caller does not need EMS.	Provider	N/A
<b>CANCELLED (NO PATIENT CONTACT)</b>	Used when the EMS unit arrives on scene, but is cancelled prior to making any patient contact, or when no patient can be found.	Medic 1 arrives on scene, but no patient can be found, or there is no patient contact on scene.	Provider	N/A
<b>STANDBY - PUBLIC SAFETY, FIRE OR EMS OPERATIONAL SUPPORT PROVIDED</b>	The disposition used for any Public Safety Standby - Fire, Law Enforcement or Emergency Management Standby.	Structure Fires, Police, or Emergency Management lead incident standby. <b>AND</b> An EMS Supervisor documenting a Blood Draw	Provider	N/A
<b>STANDBY (NO SERVICE OR SUPPORT PROVIDED)</b>	Use this disposition if the EMS unit provided standby coverage for a public or sporting event.	UNC or High School Sporting events, Races, Educational "Touch-a-Truck" events, or Community Outreach	Provider	N/A



# Medication and Equipment Placement Stat Pack Med Module



Open Area

	MR	
B	EMT	B
I	EMT- I	I
P	EMT- P	P

Dextrose 10%  
(2 x 250ml)

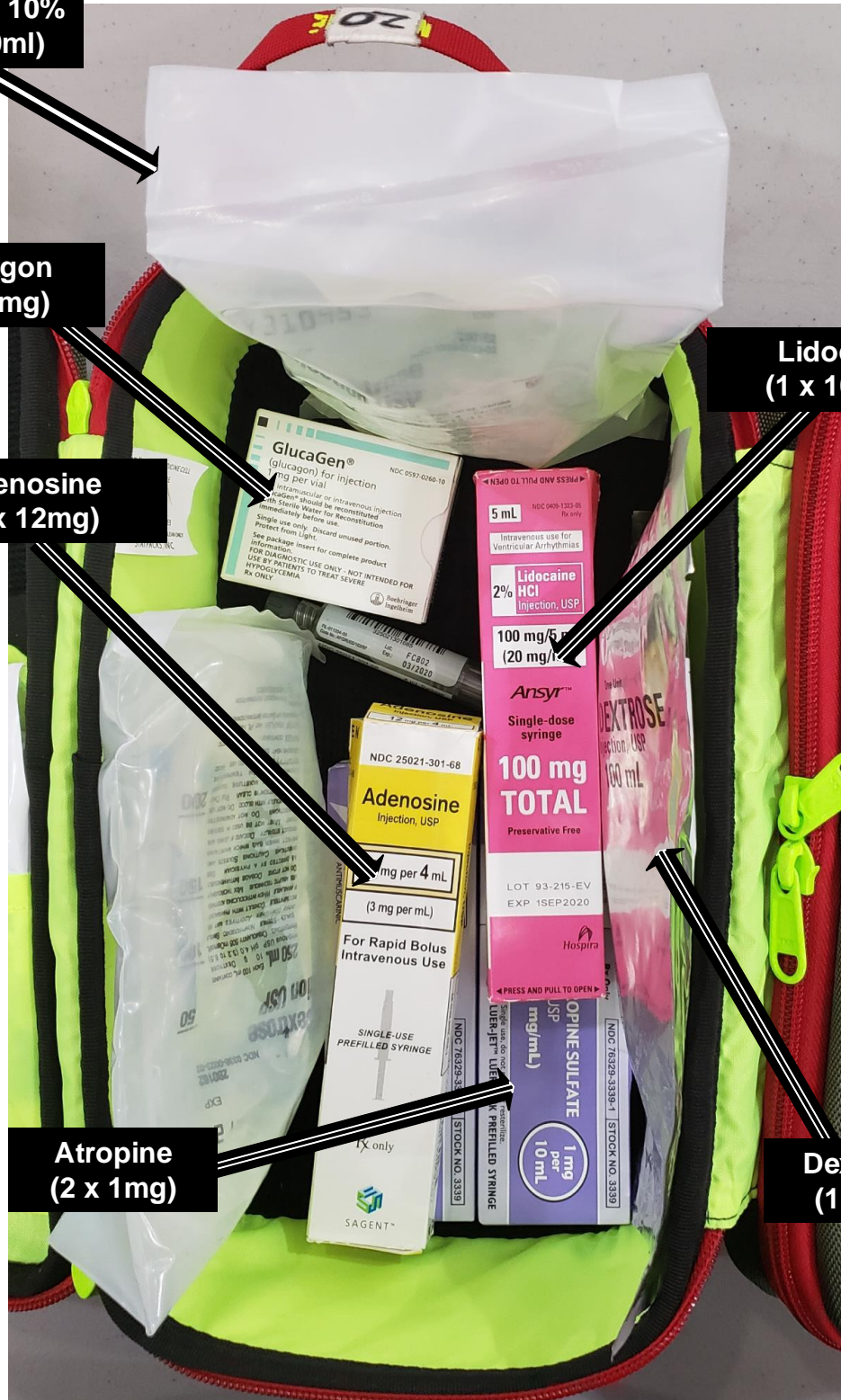
Glucagon  
(1 x 1mg)

Adenosine  
(2 x 12mg)

Lidocaine  
(1 x 100mg)

Atropine  
(2 x 1mg)

Dextrose 5%  
(1 x 100ml)







# Medication and Equipment Placement Stat Pack Med Module



## Inside Pouches

2 x 18g safety needle  
2 x 21g safety needle  
2 x 18g blunt needle

	MR	
B	EMT	B
I	EMT- I	I
P	EMT- P	P



2 x 1cc Syringe  
2 x 3cc Syringe  
2 x 10cc Syringe

1 x 60gtts/ml IV Set  
1 x 10gtts/ml IV Set



# Medication and Equipment Placement Stat Pack Med Module



	MR	
B	EMT	B
I	EMT- I	I
P	EMT- P	P

Ketorolac (3 x 30mg)

Vial and Mesh Area

Epinephrine (2 x 1mg)

Solu-Medrol  
(1 x 125mg)

Mag Sulfate  
(4 x 1mg)

Haldol  
(1 x 5mg)

Ondansetron  
(4 x 4mg)

Amiodarone  
(1 x 150mg)

Open  
(May Have  
Adenocard  
Vials when  
Prefilled Not  
Available)

Benadryl  
(2 x 50mg)

Narcan (2 x 2mg)  
MAD x 2







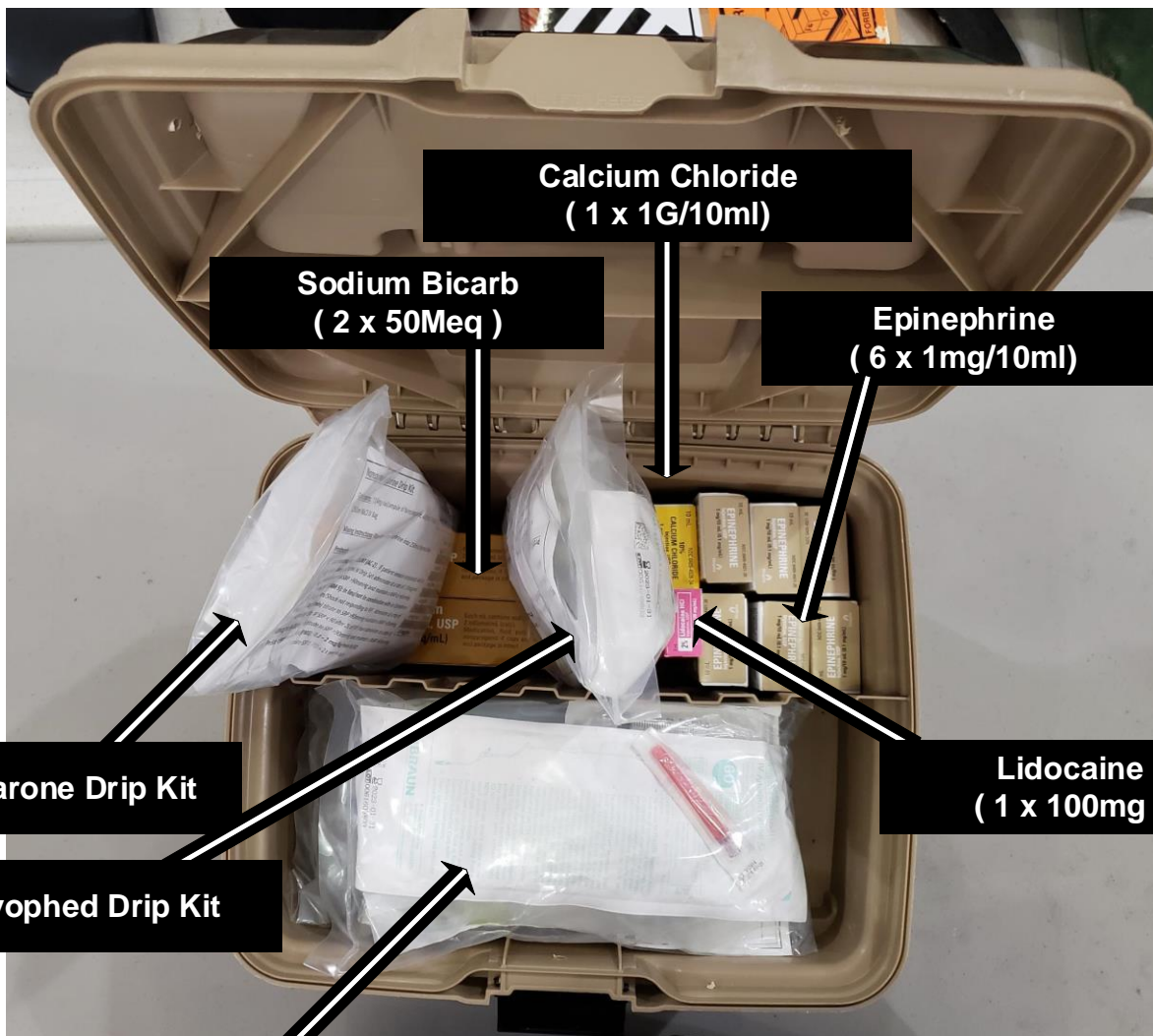


# Medication and Equipment Placement Cardiac (Tackle) Box



Open Top Area

	MR	
B	EMT	B
I	EMT- I	I
P	EMT- P	P





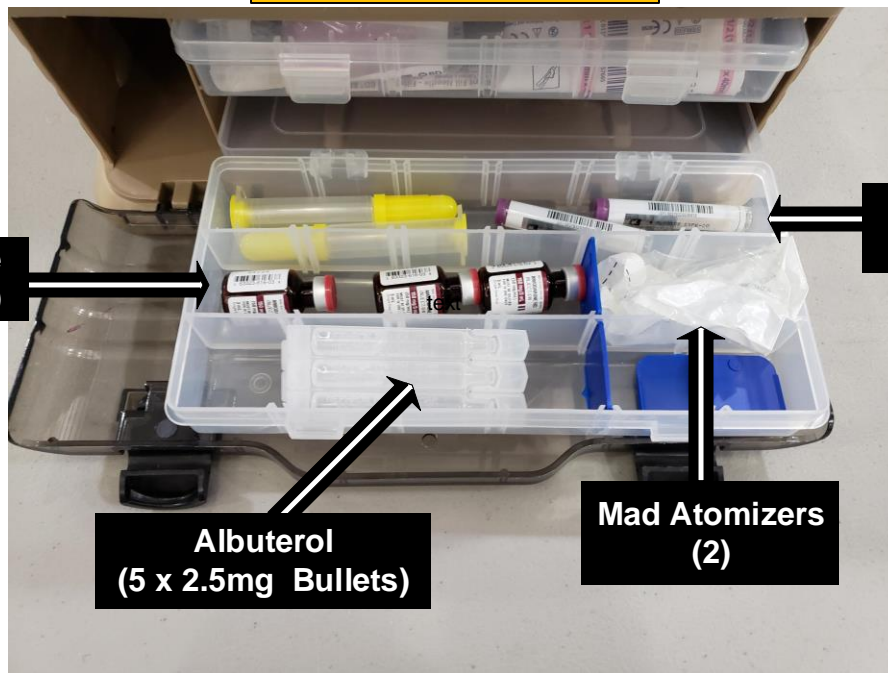
# Medication and Equipment Placement Cardiac (Tackle) Box



## Bottom Front Tray

	MR	
B	EMT	B
I	EMT- I	I
P	EMT- P	P

Amiodarone  
(3 x 150mg )



Narcan  
(2 x 2mg)

Albuterol  
(5 x 2.5mg Bullets)

Mad Atomizers  
(2)

## Top Front Tray



Syringes (1cc, 3cc,  
10cc (1ea))



# Appendix



# Cardiac Arrest

## EMS Triage and Destination Plan



### Cardiac Arrest Patient

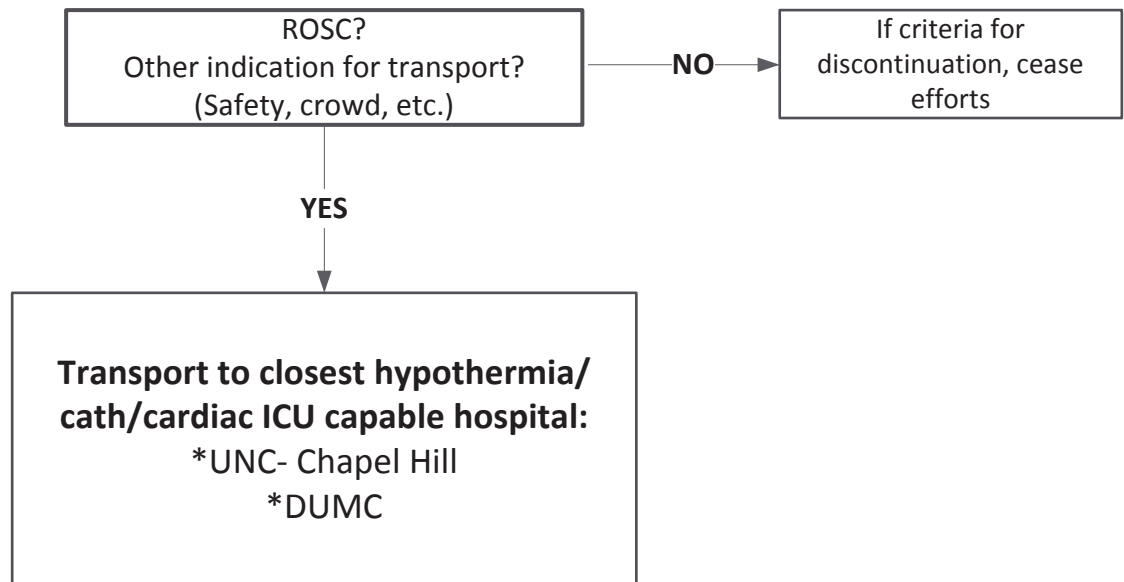
\*Resuscitation was attempted by 911 provider

### And/Or

\* CPR performed prior to EMS arrival and pulses restored

### The Purpose of this plan is to:

\*Transport cardiac arrest and post resuscitation patients to the appropriate receiving facility



### Pearls and Definitions

- \*All Cardiac Arrest Patients who are being transported must be triaged and transported using this plan, except under director order from EMS System Medical Control. This plan is in effect 24/7/365
- \*All patient care is based on the appropriate protocol
- \*This protocol and the destinations in it have been approved by the Orange County EMS System Peer Review Committee
- \*UNC-Chapel Hill and DUMC are appropriate facility for all presumed etiology of cardiac arrest. Additionally, both are pediatric centers and appropriate for transport of those < 18 in the setting of cardiac arrest.
- \*UNC-Chapel Hill and DUMC are appropriate facilities for traumatic arrest as they are Level 1 trauma facilities.

# Pediatric EMS Triage and Destination Plan



## Pediatric Patient

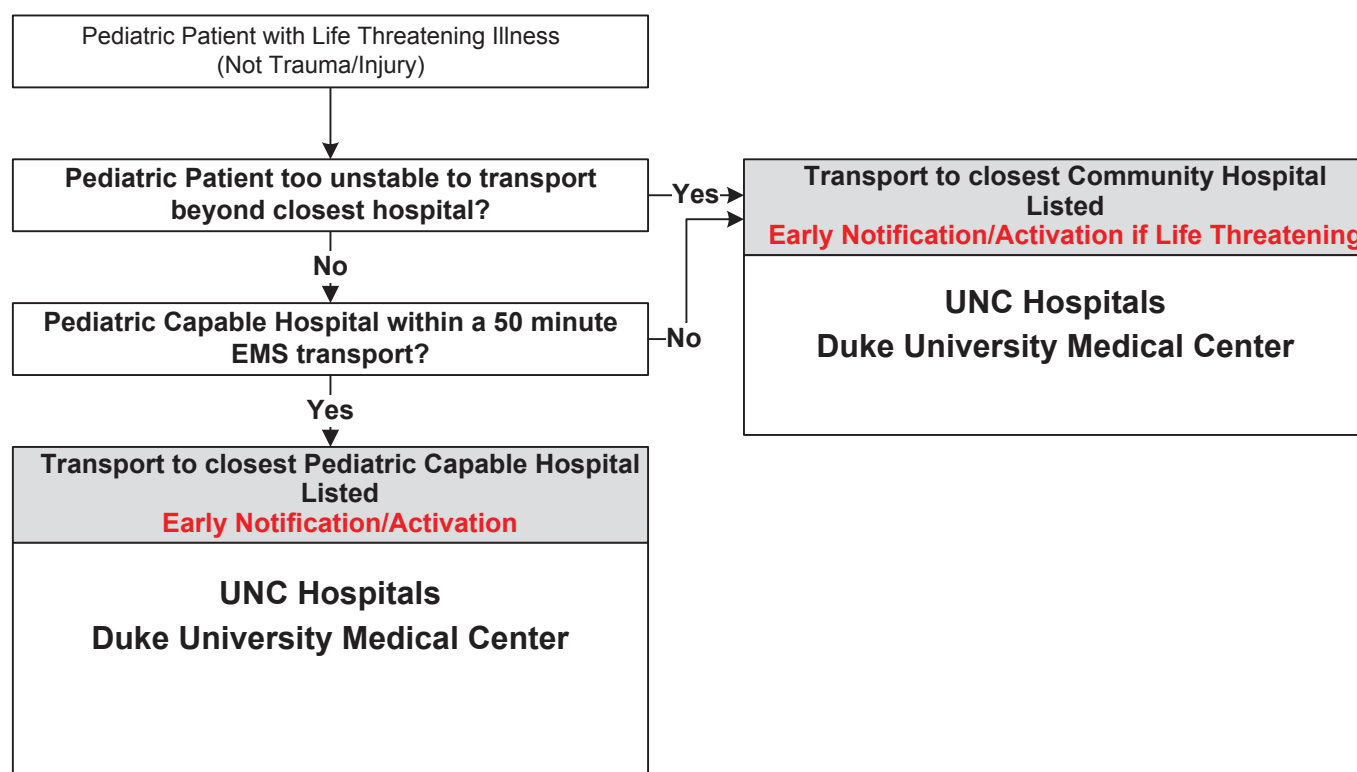
- \* Any patient less than 16 years of age with a life-threatening illness (Not Trauma)

## Life Threatening Illness

- \* Decreased Mental Status (GCS<13)
- \* Non-Responsive Respiratory Distress
- \* Intubation
- \* Post Cardiac Arrest
- \* Non-Responsive Hypotension (shock)
- \* Severe Hypothermia or Hyperthermia
- \* Status Epilepticus
- \* Potential Dangerous Envenomation
- \* Life Threatening Ingestion/Chemical Exposure
- \* Children with Special Healthcare Needs (and destination choice based on parental request)

## The Purpose of this plan is to:

- \* Rapidly identify pediatric patients who call 911 or present to EMS with a life-threatening illness
- \* Minimize the time from EMS contact to definitive care
- \* Quickly diagnose patients with pediatric life-threatening illness for EMS treatment and stabilization
- \* Rapidly identify the best hospital destination based on symptom onset time, vital signs, response to treatment, and predicted transport time
- \* Early activation/notification to the hospital prior to patient arrival
- \* Minimize scene time with a "load and go" approach
- \* Provide quality EMS service and patient care to the EMS community
- \* Continuously evaluate the EMS System based on North Carolina's EMS performance measures



## Pearls and Definitions

- \* All Pediatric Patients with a life-threatening illness must be triaged and transported using this plan. This plan is in effect 24/7/365.
- \* The Trauma and Burn Triage and Destination Plan should be used for all injured patients regardless of age.
- \* All Patient Care is based on the EMS Pediatric Protocol
- \* Pediatric Capable Hospital = a hospital with an emergency and pediatric intensive care capability including but not limited to:
  - \* Emergency Department staffed 24 hours per day with board certified Emergency Physicians
  - \* An inpatient Pediatric Intensive Care Unit (with a physician pediatric intensivist available in-house or on call 24/7/365)
  - \* Accepts all EMS patients regardless of bed availability
  - \* Provides outcome and performance measure feedback to EMS including case review
- \* Community Hospital = a local hospital within the EMS System's service area which provides emergency care but does not meet the criteria of a Pediatric Capable Hospital
- \* Pediatric Specialty Care Transport Program = an air or ground based specialty care transport program that has specific pediatric training and equipment addressing the needs of a pediatric patient that can assume care of a pediatric patient from EMS or a Community Hospital and transport the patient to a Pediatric Capable Hospital.

# Sepsis

## EMS Triage and Destination Plan



### Sepsis Patient

- \* Obvious or suspected infection **AND** any of these SIRS criteria:

SBP < 90 mmHg  
Heart rate > 90/min  
Respiratory Rate > 20  
Temperature  $\geq 100.4^{\circ}\text{F}$  or  $< 96.0^{\circ}\text{F}$   
New onset altered mental status - GCS < 15

### And

End tidal CO  $< 26$  mmHg  
OR

SBP < 90 mmHg after fluid resuscitation

### The Purpose of this plan is to:

- \* Rapidly identify Sepsis patients who call 911 or present to EMS
- \* Rapidly identify the best hospital destination based on symptom onset time, vital signs, response to treatment, and patient presentation
- \* Early activation/notification to the hospital prior to patient arrival
- \* Minimize scene time to 15 minutes or less
- \* Provide quality EMS service and patient care to the EMS System's citizens
- \* Continuously evaluate the EMS System based on North Carolina's Sepsis EMS performance measures

SIRS criteria with suspected infection and  
EtCO<sub>2</sub> < 26 mmHg OR SBP < 90 mmHg after fluid resuscitation  
(or pressor administration)

Transport to closest Hospital listed  
**Early Sepsis Notification/Activation**

\*UNC- Chapel Hill  
\*Duke University Medical Center

### Pearls and Definitions

- \*All Sepsis Patients must be triaged and transported using this plan. This plan is in effect 24/7/365
- \*All Patient Care is based on the EMS Sepsis/Fever Protocol
- \*This protocol and the destinations in it have been approved by the Orange County EMS System peer Review Committee
- \*Obtain the following information before your radio call in: Patient age and gender, clinical presentation, history, symptoms that suggest this is a septic event (See Sepsis/Fever Protocol)
- \*If the patient meets the criteria above call a CODE SEPSIS
- \*If concern for sepsis, but do not meet criteria do NOT call "Code Sepsis." Instead, consult physician due to concern for possible Septic infection.



# STEMI

## EMS Triage and Destination Plan



### STEMI Patient

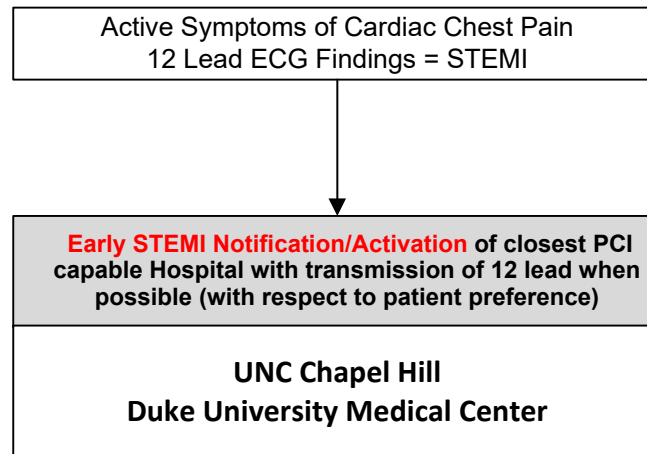
#### (ST Elevation Myocardial Infarction)

- \* Cardiac symptoms greater than 15 minutes and less than 12 hours
- And
- \* 12 lead ECG criteria of 1 mm ST elevation in 2 or more contiguous leads

(SEE BELOW or CHEST PAIN/STEMI PROTOCOL or CODE STEMI Procedure for CODE STEMI Criteria)

### The Purpose of this plan is to:

- \* Rapidly identify STEMI patients who call 911 or present to EMS
- \* Minimize the time from onset of STEMI symptoms to coronary reperfusion
- \* Quickly diagnose a STEMI by 12 lead ECG
- \* Rapidly identify the best hospital destination based on symptom onset time, and predicted transport time
- \* Early activation/notification to the hospital prior to patient arrival
- \* Minimize scene time to 10 minutes or less (including a 12 lead ECG)
- \* Provide quality EMS service and patient care to the EMS Systems citizens
- \* Continuously evaluate the EMS System based on North Carolina's STEMI EMS performance measures



STEMI EMS Triage and Destination Plan

### Pearls and Definitions

- \* **All STEMI Patients must be triaged and transported using this plan.**
- \* **All Patient Care is based on the EMS Chest Pain and STEMI Protocol**
- \* Obtain the following information *before* radio call in:
  - \* Patient age and gender, clinical presentation, history, symptoms that suggest this is an acute cardiac event, and what are the 2 or more anatomically contiguous leads with 1 + mm ST elevation
- \*\*\* **If there is concern for STEMI in the setting of ANY of the following:**
  - \* **LBBB not known to be old?**
  - \* **Presence of LVH**
  - \* **Presence of profound tachycardia (heart rate >129)**
  - \* **Presence of pacemaker activity**
  - \* **Resuscitated from cardiac arrest but does not have obvious STEMI?**
- \*\*\* **THEN** transmit 12-lead for **ED Physician Consultation** instead of calling a "Code STEMI". Be sure to communicate the need for physician consult due to concern for possible STEMI or AMI.



# Stroke

## EMS Triage and Destination Plan



### Stroke Patient

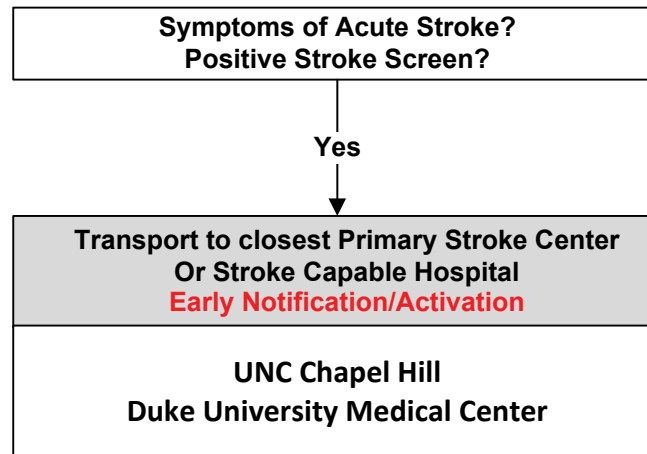
\* A patient with symptoms of an acute Stroke as identified by the EMS Stroke Screen

### Time of Symptom Onset

\* Defined as the last witnessed time the patient was symptom free (i.e. the time of onset for a patient awakening with stroke symptoms would be the last time he/she was known to be symptom free before the sleep period)

### The Purpose of this plan is to:

- \* Rapidly identify acute Stroke patients who call 911 or present to EMS
- \* Minimize the time from onset of Stroke symptoms to definitive care
- \* Quickly diagnose a Stroke using validated EMS Stroke Screen
- \* Rapidly identify the best hospital destination based on symptom onset time, reperfusion checklist, and predicted transport time
- \* Early activation/notification to the hospital prior to patient arrival
- \* Minimize scene time to 10 minutes or less
- \* Provide quality EMS service and patient care to the EMS Systems citizens
- \* Continuously evaluate the EMS System based on North Carolina's Stroke EMS performance measures



Stroke EMS Triage and Destination Plan

### Pearls and Definitions

- \* All Stroke Patients must be triaged and transported using this plan. This plan is in effect 24/7/365
- \* All Patient Care is based on the EMS Suspected Stroke Protocol
- \* Primary Stroke Center = a hospital that is currently accredited by the Joint Commission as a Primary Stroke Center. Free standing emergency departments and satellite facilities are not considered part of the Primary Stroke Center.
- \* Stroke Capable Hospital = a hospital which provides emergency care with a commitment to Stroke and the following capabilities:
  - \* CT availability with in-house technician availability 24/7/365
  - \* Ability to rapidly evaluate an acute stroke patient to identify patients who would benefit from thrombolytic administration
  - \* Ability and willingness to administer thrombolytic agents to eligible acute Stroke patients
  - \* Accepts all patients regardless of bed availability
  - \* Provides outcome and performance measure feedback to EMS including case review
- \* Community Hospital = a local hospital within the EMS System's service area which provides emergency care but does not meet the criteria for a Primary Stroke Center or Stroke Capable Hospital
- \* Specialty Care Transport Program = an air or ground based specialty care transport program which can assume care of an acute Stroke patient from EMS or a Hospital and transport the patient to a Primary Stroke Center.



# Trauma and Burn

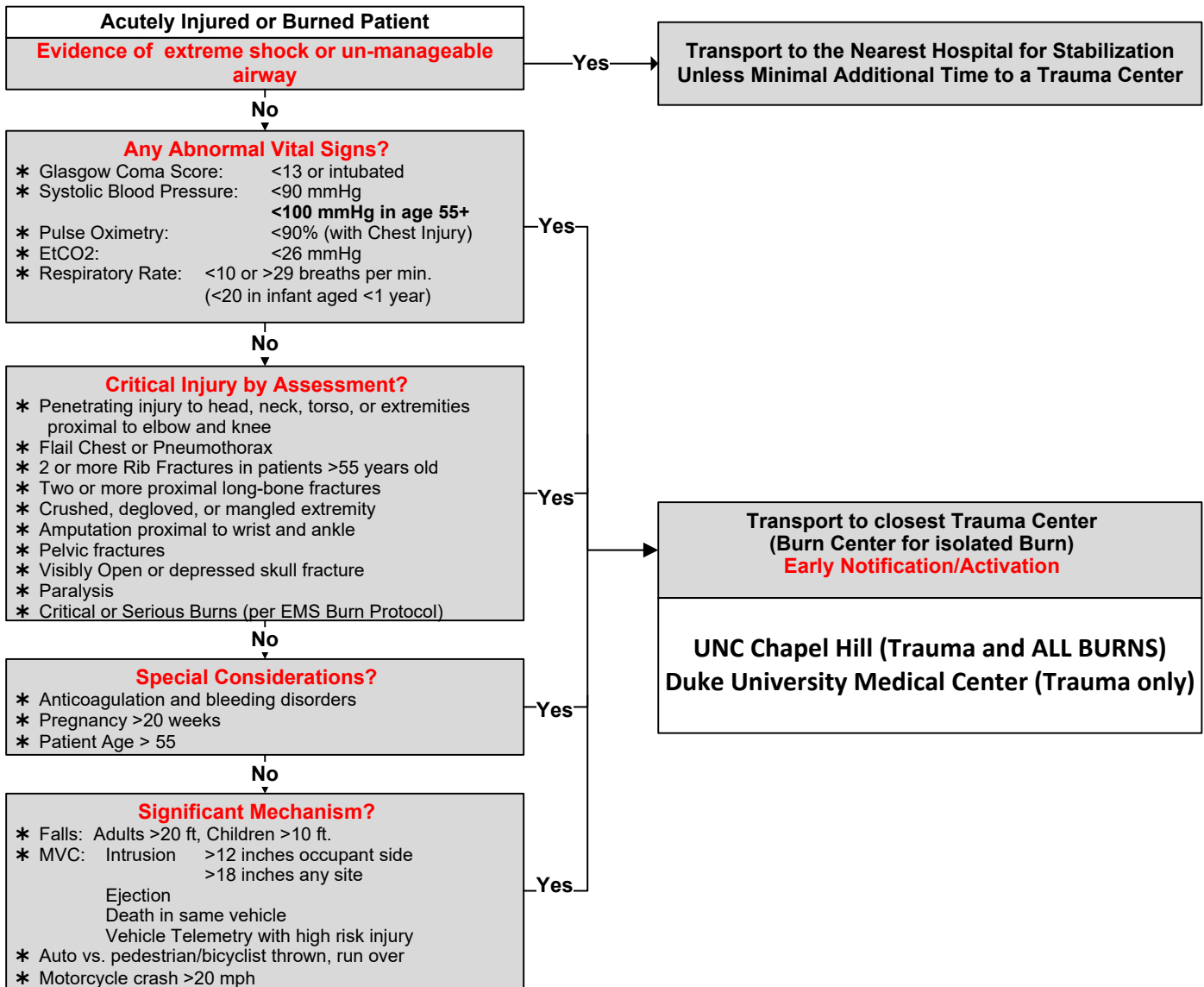
## EMS Triage and Destination Plan



**Trauma and Burn Patient** = Any patient less (regardless of age) with a significant injury or burn

### The Purpose of this plan is to:

- \* Rapidly identify Trauma patients who call 911 or present to EMS
- \* Rapidly identify the best hospital destination based on symptom onset time, vital signs, response to treatment, and patient presentation
- \* Early activation/notification to the hospital destination based on time of injury, severity of injury, and predicted transport time
- \* Minimize scene time to 10 minutes or less
- \* Provide quality EMS service and patient care to the EMS System's citizens
- \* Continuously evaluate the EMS System based on North Carolina's Trauma EMS performance measures



Trauma and Burn EMS Triage and Destination Plan

### Pearls and Definitions

- \* **All Injury and Burn Patients must be triaged and transported using this plan. This plan is in effect 24/7/365**
- \* **All Patient Care is based on the EMS Trauma Protocols**
- \* **Multiple rib fractures in the elderly is associated with high mortality and therefore benefit from transportation to a Trauma Center**
  - \* For each additional rib fracture after 2, the patient's mortality rate increases by around 20%
- \* **Designated Trauma Center** = a hospital that is currently designated as a Trauma Center by the North Carolina Office of Emergency Medical Services. Trauma Centers are designated as Level 1, 2, or 3 with Level 1 being the highest possible designation. Free standing emergency departments and satellite facilities are not considered part of the Trauma Center.
- \* **Burn Center** = a ABA verified Burn Center co-located with a designated Trauma Center
- \* **Community Hospital** = a local hospital within the EMS System's service area which provides emergency care but has not been designated as a Trauma Center
- \* **Specialty Care Transport Program** = an air or ground based specialty care transport program which can assume care of an acutely injured patient from EMS or a Community Hospital and transport the patient to a designated Trauma Center



# Pandemic EMS Triage and Destination Plan



## Suspected Pandemic Patient

### The Purpose of this plan is to:

- \* Prevent transmission of pandemic illnesses to facilities that do not have proper isolation procedures or capabilities.
- \* Limit the number of receiving facilities treating pandemic patients

Active Symptoms of Illness meeting Special  
Circumstance protocol(s)



Early notification to receiving hospital.

**UNC Chapel Hill  
Duke University Medical Center**

Pandemic EMS Triage and Destination Plan

### Pearls and Definitions

- \* See associated PPE recommendations based on the associated SC Protocol
- \* Do not enter hospital until directed to do so
- \* Follow all hospital guidance.